MSI

915P/G Neo2
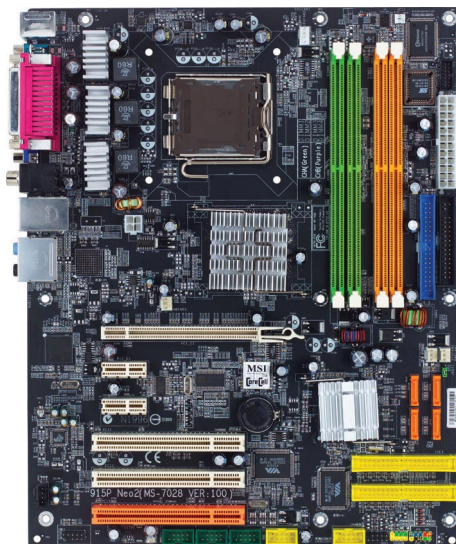## MS-7028 (v1.X) ATX Mainboard

G52-M7028X1

Manual Rev: 1.0
Release Date: May 2004

CE **N1996**

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Notice 1
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2
Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

FC **Micro-Star International**
MS-7028
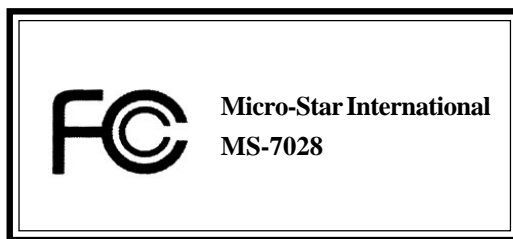
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation

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Revision History

Revision	Revision History	Date
V1.0	First release for PCB 1.X with Intel 915P/G & ICH6R	May 2004

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

➤ Visit the MSI homepage & FAQ site for technical guide, BIOS updates, driver updates, and other information: **http://www.msi.com.tw** & **http://www.msi.com.tw/program/service/faq/faq/esc_faq_list.php**

➤ Contact our technical staff at: **support@msi.com.tw**

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. **Do not cover the openings.**
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
    ➤ The power cord or plug is damaged.
    ➤ Liquid has penetrated into the equipment.
    ➤ The equipment has been exposed to moisture.
    ➤ The equipment has not work well or you can not get it work according to User's Manual.
    ➤ The equipment has dropped and damaged.
    ➤ The equipment has obvious sign of breakage.
12. **Do not leave this equipment in an environment unconditioned, storage temperature above 60^{0}C (140^{0}F), it may damage the equipment.**

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

CONTENTS

Getting Started

Thank you for choosing the **915P/G Neo2 Platinum** (MS-7028) v1.X ATX mainboard. The **915P/G Neo2 Platinum** mainboard is based on **Intel® 915P/G** and **Intel® ICH6R** chipset for optimal system efficiency. Designed to fit the advanced **Intel® Pentium 4 Prescott LGA775** processor, the **915P/G Neo2 Platinum** mainboard delivers a high performance and professional desktop platform solution.

Mainboard Specifications

CPU
➤ Supports Intel® Pentium 4 Prescott LGA775 processors in LGA775 package.
➤ Supports up to Pentium 4 3XX, 5XX & 7XX sequence processor or higher speed.
➤ Supports Intel Hyper-Threading Technology.
(For the latest information about CPU, please visit http://www.msi.com.tw/program/
products/mainboard/mbd/pro_mbd_cpu_support.php)

Chipset
➤ Intel® 915P/G chipset
  - Supports FSB 800MHz.
  - Supports PCI Express x16 interface.
  - Supports DDR2 400/533 memory interface.
  - Integrated graphics controller (for 915G only).
➤ Intel® ICH6R chipset
  - Hi-Speed USB (USB2.0) controller, 480Mb/sec, up to 8 ports.
  - 4 Serial ATA ports with transfer rate up to 1.5Gb/s.
  - 1 channel Ultra ATA 100 bus Master IDE controller.
  - PCI Master v2.3, I/O APIC.
  - ACPI 2.0 Compliant.
  - Serial ATA 150 RAID 0, RAID 1 and Matrix RAID.
  - Integrated AHCI controller.

Main Memory
➤ Supports four unbuffered DIMM of 1.8 Volt DDR2 SDRAM
➤ Supports up to 4GB memory size.
➤ Supports Dual channel DDR2 memory architecture.
➤ Supports DDR2 400/533 memory interface.
(For the updated supporting memory modules, please visit http://www.msi.com.tw/
program/products/mainboard/mbd/pro_mbd_trp_list.php.)

Slots
➤ One PCI Express x16 slot (supports PCI Express Bus specification v1.0a compliant).
➤ Two PCI Express x1 slots (supports PCI Express Bus specification v1.0a compliant).
➤ Three 32-bit v2.3 Master PCI bus slots (support 3.3v/5v PCI bus interface).

On-Board IDE
➤ One Ultra DMA 66/100 IDE controllers integrated in ICH6R.
  - Supports PIO, Bus Master operation modes.
  - Can connect up to Two Ultra ATA drives.
➤ Serial ATA 150 controller integrated in ICH6R.
  - Up to 150MB/sec transfer speed.
  - Can connect up to four Serial ATA devices.
  - Supports AHCI controller with SATA Raid 0, Raid 1 and Matrix Raid.
  - Supports SATA hot plug.

VIA6410 IDE Raid Controller
➤ Two Ultra DMA 66/100/133 IDE Controllers.
➤ Supports RAID 0, 1 and 0+1.
➤ Connect up to 4 Ultra ATA 133 devices.

On-Board Peripherals
➤ On-Board Peripherals include:
   - 1 floppy port supports 1 FDD with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes
   - 1 serial port
   - 1 VGA port (for 915G only, Optional)
   - 1 parallel port supports SPP/EPP/ECP mode
   - 1 Line-In / Line-Out / MIC-In / Rear Speaker Out / Center-Subwoofer Speaker Out
     / SPDIF-Out optical and coaxial audio port
   - 8 USB ports (Rear * 4/ Front * 4)
   - 1 RJ-45 LAN jack
   - 3 IEEE 1394 connectors

LAN
➤ Broadcom BCM5751 PCI-E Gb LAN Controller
   - PCI Express bus Spec 1.0a compliant.
   - x1 PCI Express interface with 2.5 Gb/s bandwidth.
   - 10/100/1000 IEEE 802.3 compliant.

Audio
➤ Azalia link controller integrated in Intel® ICH6R chipset.
➤ 8-channel audio codec CMI9880L.
   - Compliant with Azalia 1.0 Spec.
   - Supports Multi-Streaming function.
   - Supports Universal Audio Jack (only Front Audio Jack).

BIOS
➤ The mainboard BIOS provides "Plug & Play" BIOS which detects the peripheral
   devices and expansion cards of the board automatically.
➤ The mainboard provides a Desktop Management Interface (DMI) function which
   records your mainboard specifications.

Mounting and Dimension
➤ ATX Form Factor: 24.4 cm (W) x 30.5 cm (L)
➤ 9 mounting holes

Mainboard Layout
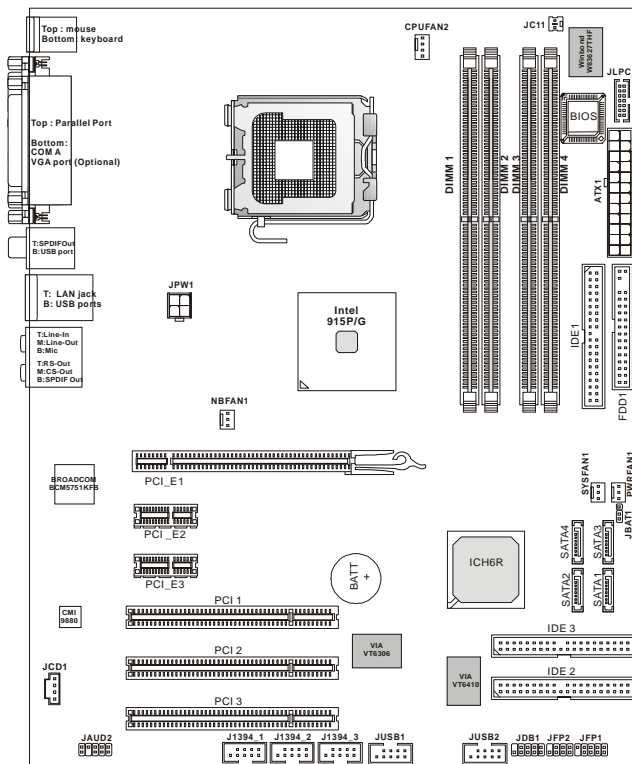
915P/G Neo2 Platinum (MS-7028) v1.X ATX Mainboard

Packing Contents

MSI motherboard
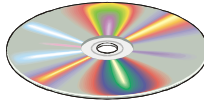
MSI Driver/Utility CD

SATA Cable

Power Cable

D-Bracket 2

Round Cable for IDE Devices

User's Guide

Back IO Shield

Round Cable for Floppy Disk

MSI Special Features

Core Cell™ Chip

By diagnosing the current system utilization, the CoreCell™ Chip automatically directs your motherboard to the most adequate state and leads to less noise, longer duration and more power-saving.

• BuzzFree

Stealth technology makes you leave without a trace. Reduce heat and noise from your system.

• PowerPro

Intelligent power saving technique prevents waste by energy conservation.

• LifePro

Sophisticated moderate mechanism could prolong components' duration for longer journey.

• Speedster

Empower your system with Dynamic Overclocking, bestow you ability to eliminate obstacles ahead.

CPU Voltage Manual Mode

100% Selected CPU Voltage → MSI CoreCell → 100% Actual CPU Voltage
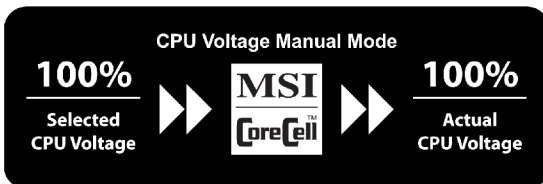
MSI CoreCell brings you high performance

DigiCell

DigiCell is a powerful utility developed by MSI, which provides the easiest way to conduct your digital home and the central cell of multiple digital devices.

For detailed instruction please refer to Chapter 4: Introduction to DigiCell.

The outstanding features of DigiCell contain:

Activate Software Gateway
* Share one broadband access with all clients
* Save the cost of physical WLAN gateway
Connect with MEGA Stick
* Plug-n-Play, Drag-n-Drop
* Edit and print play list at convenience
* Connected by USB or Bluetooth
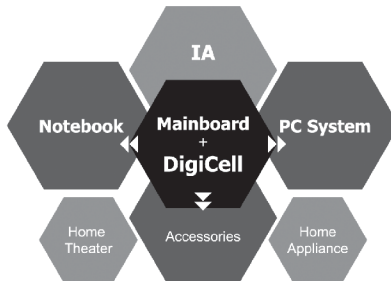
Connectivity Upgrade by DigiCell

Other Features

Automatic Voltage Compensation Mechanism
* Adjust the Vcore to minimize Vcore voltage inaccuracy
* Supplemental circuit gives a more precise voltage
* Enhanced Compatibility & Reliability

* Painless BIOS recovery from corruption
* Restore BIOS from backup area in single flash ROM

* Contains all the necessary BIOS options for tweaking
  and overclocking
(Please check Chapter 3: BIOS Setup for details)
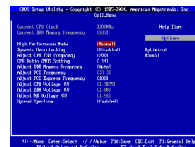
2

Hardware Setup

This chapter tells you how to install the CPU, memory modules, and expansion cards, as well as how to setup the jumpers on the mainboard. Also, it provides the instructions on connecting the peripheral devices, such as the mouse, keyboard, etc.

While doing the installation, be careful in holding the components and follow the installation procedures.

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BATT
+
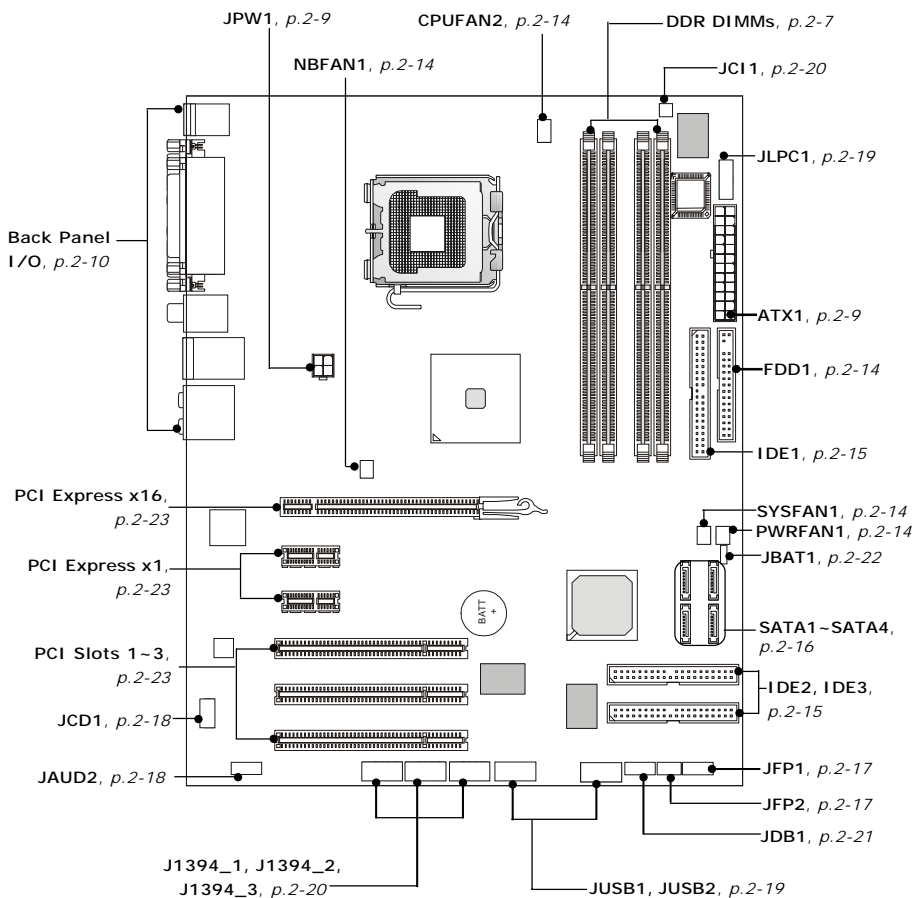
Central Processing Unit: CPU

The mainboard supports Intel® Pentium 4 Prescott processor. The mainboard uses a CPU socket called LGA775. When you are installing the CPU, **make sure to install the cooler to prevent overheating.** If you do not have the CPU cooler, contact your dealer to purchase and install them before turning on the computer.

For the latest information about CPU, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_cpu_support.php.

MSI **MSI Reminds You...**

Overheating
Overheating will seriously damage the CPU and system, always make sure the cooling fan can work properly to protect the CPU from overheating.

Replacing the CPU
While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from grounded outlet first to ensure the safety of CPU.

Overclocking
This motherboard is designed to support overclocking. However, please make sure your components are able to tolerate such abnormal setting, while doing overclocking. Any attempt to operate beyond product specifications is not recommended. ***We do not guarantee the damages or risks caused by inadequate operation or beyond product specifications.***

Introduction to LGA 775 CPU

The pin-pad side of LGA 775 CPU.
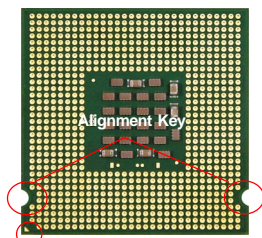
The surface of LGA 775 CPU. Remember to apply some silicone heat transfer compound on it for better heat dispersion.

Alignment Key

Alignment Key

Yellow triangle is the Pin 1 indicator
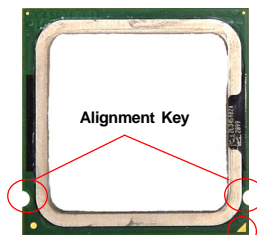
Yellow triangle is the Pin 1 indicator

CPU & Cooler Installation

When you are installing the CPU, **make sure the CPU has a cooler attached on the top to prevent overheating.** If you do not have the cooler, contact your dealer to purchase and install them before turning on the computer. Meanwhile, do not forget to apply some silicon heat transfer compound on CPU before installing the heat sink/cooler fan for better heat dispersion.

Follow the steps below to install the CPU & cooler correctly. Wrong installation will cause the damage of your CPU & mainboard.

1. The CPU has a plastic cap on it to protect the contact from damage. Before you have installed the CPU, always cover it to protect the socket pin.
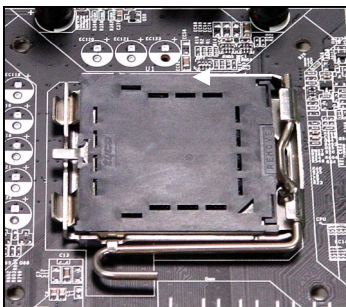
2. Remove the cap from lever hinge side (as the arrow shows).
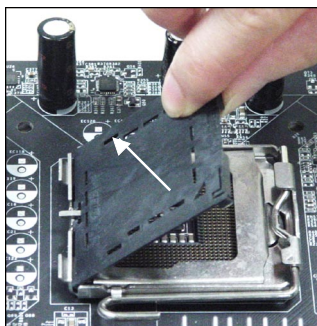
3. The pins of socket reveal.
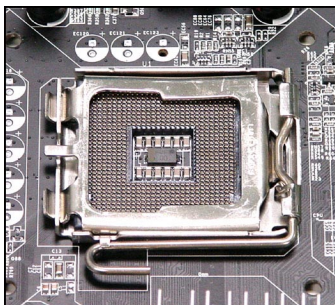
4. Open the load lever.
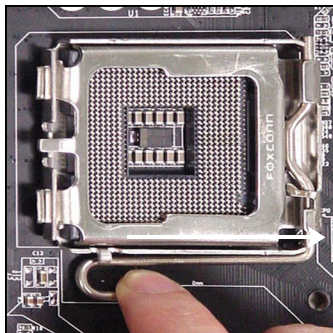
5. Lift the load lever up and open the load plate.
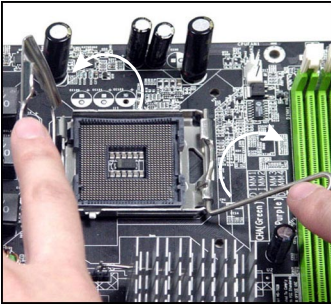
6. After confirming the CPU direction for correct mating, put down the CPU in the socket housing frame. Be sure to grap on the edge of the CPU base. Note that the alignment keys are matched.
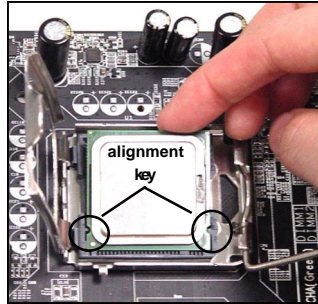
7. Visually inspect if the CPU is seated well into the socket. If not, take out the CPU with pure vertical motion and reinstall.
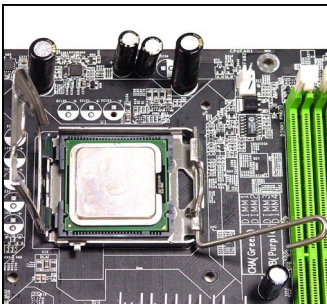
8. Cover the load plate onto the package.
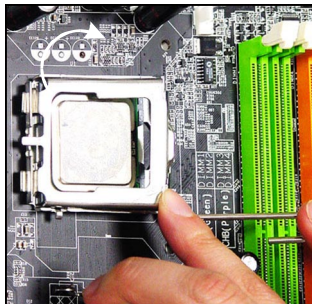
9. Press down the load lever lightly onto the load plate, and then secure the lever with the hook under retention tab.
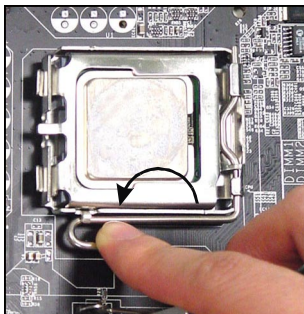
10. Align the holes on the mainboard with the heatsink. Push down the cooler until its four clips get wedged into the holes of the mainboard.
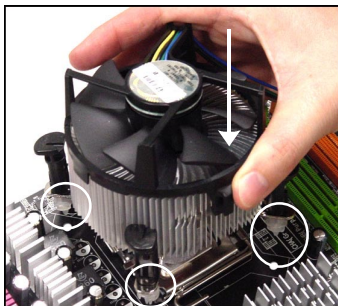
11. Press the four hooks down to fasten the cooler. Then rotate the locking switch (refer to the correct direction marked on it) to lock the hooks.

locking switch
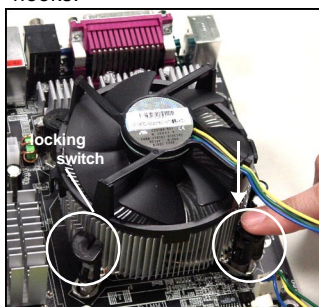
12. Turn over the mainboard to confirm that the clip-ends are correctly inserted.

MSI Reminds You...

MSI
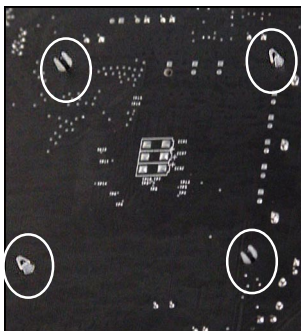
1. Confirm if your CPU cooler is firmly installed before turning on your system.

*2. Check the information in **PC Health Status** of **H/W Monitor** in BIOS (refer to p.3-20 for details) for the CPU temperature.*

3. Do not touch the CPU socket pins to avoid damaging.

4. Whenever CPU is not installed, always protect your CPU socket pin with the plastic cap covered (shown in Figure 1) to avoid damaging.

5. Please note that the mating/unmating durability of the CPU is 20 cycles. Therefore we suggest you do not plug/unplug the CPU too often.

Memory

The mainboard provides 4 slots for 240-pin DDR2 DIMM, which supports the memory size up to 4GB.

Since DDR2 modules are not interchangeable with DDR1 and the DDR2 standard is not backward compatible, you should always install DDR2 memory module in the DDR2 slot (DIMM1~DIMM4). Otherwise, you are not able to boot up your system and your mainboard might be damaged.

For the updated supporting memory modules, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_trp_list.php.
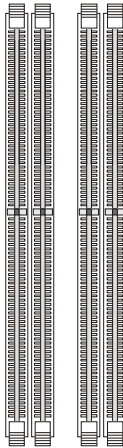
**DIMM1~DIMM4
(from left to right)**

**Channel A (DIMM1, DIMM2): Green
Channel B (DIMM3, DIMM4): Orange**

Introduction to DDR2 SDRAM

DDR2 is a new technology of memory module, and its speed is the top limit of current DDR1 technology. DDR2 uses a 1.8V supply for core and I/O voltage, compared to 2.5V for DDR1, and requires 28% less power than DDR1 chips. DDR2 truly is the future of memory, but will require some changes as the technology is not backwardly compatible and only motherboards specifically designed for DDR2 memory will be able to support these chips.

DDR2 incorporates new features at the chip level that give it better signal integrity, thereby enabling higher clock speeds.

DDR2 modules have 240 pins, versus 184 pins on a DDR1 module, and the length of DDR2 module is 5.25". DDR2 modules have smaller and tighter spaced pins. The height of DDR2 modules varies, but they will typically be less than 1.3" in height.

Memory Module Population Rules

Install at least one DIMM module on the slots. Each DIMM slot supports up to a maximum size of 1GB. Users can install either single- or double-sided modules to meet their own needs. Please note that *each DIMM can work respectively for single-channel DDR, while both channels (in different color) populated with same amount of memory size will work as dual-channel DDR*, no matter how many DIMM modules are populated.

Below are the example of single-channel/dual-channel DDR modes.
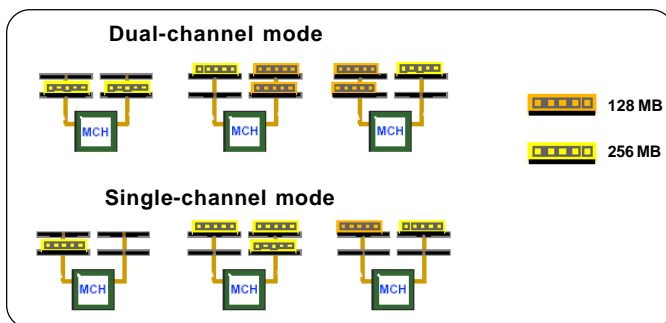
Installing DDR2 Modules

1. The DDR2 DIMM has only one notch on the center of module. The module will only fit in the right orientation.
2. Insert the DIMM memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the socket.
3. The plastic clip at each side of the DIMM slot will automatically close.
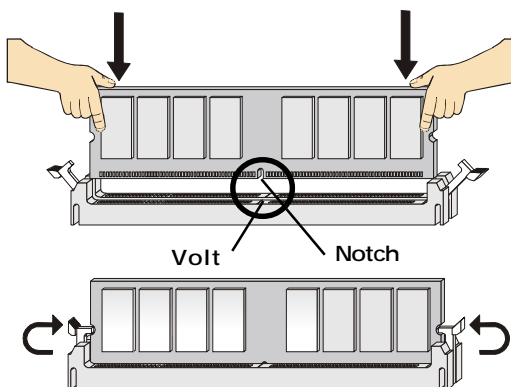
MSI Reminds You...
You can barely see the golden finger if the module is properly inserted in the socket.

Power Supply

The mainboard supports ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

ATX 24-Pin Power Connector: ATX1

This connector allows you to connect an ATX 24-pin power supply. To connect the ATX 24-pin power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.

You may use the 20-pin ATX power supply power supply as you like. If you'd like to use the 20-pin ATX power supply, please plug your power supply along with pin 1 & pin 13 (refer to the image at the right hand). There is also a foolproof design on pin 11, 12, 23 & 24 to avoid wrong installation.

Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS-ON#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWR OK	20	Res
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	NC	24	GND

ATX1

ATX 12V Power Connector: JPW1

This 12V power connector is used to provide power to the CPU.

JPW1 Pin Definition

PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

JPW1

MSI Reminds You...
1. *These two connectors connect to the ATX power supply and have to work together to ensure stable operation of the mainboard.*
2. *Power supply of 350 watts (and above) is highly recommended for system stability.*
3. *ATX 12V power connection should be greater than 18A.*

Back Panel

The back panel provides the following connectors:

Mouse **Parallel** **S/PDIF** **LAN** **L-In** **RS-Out**

Keyboard **COM A** **VGA port (Optional)** **USB Ports** **L-Out** **CS-Out**
Mic **SPDIF Out**
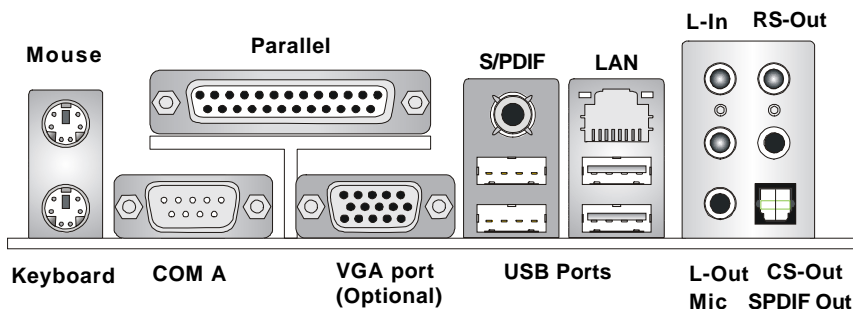
Mouse/Keyboard Connector

The mainboard provides a standard PS/2® mouse/keyboard mini DIN connector for attaching a PS/2® mouse/keyboard. You can plug a PS/2® mouse/keyboard directly into this connector. The connector location and pin assignments are as follows:

6 5
4 3
2 1
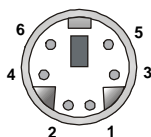
PS/2 Mouse / Keyboard
(6-pin Female)

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	Mouse/Keyboard Data	Mouse/Keyboard data
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Mouse/Keyboard Clock	Mouse/Keyboard clock
6	NC	No connection

VGA Connector (Optional)

The mainboard provides a DB 15-pin female connector to connect a VGA monitor.

5 1
15 11
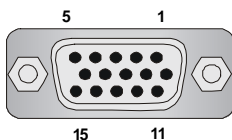
VGA Connector
(DB 15-pin)

Pin	Signal Description	Pin	Signal Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	+5V	10	GND
11	N/C	12	SDA
13	Horizontal Sync	14	Vertical Sync
15	SCL		

Serial Port Connector

The mainboard offers one 9-pin male DIN connector as the serial port. The port is a 16550A high speed communication port that sends/receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.

Pin Definition

1 2 3 4 5

6 7 8 9
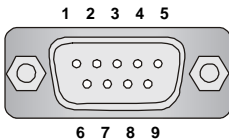
9-Pin Male DIN Connector

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready)
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicate

USB Connectors

The mainboard provides an OHCI (Open Host Controller Interface) Universal Serial Bus root for attaching USB devices such as keyboard, mouse or other USB-compatible devices. You can plug the USB device directly into the connector.
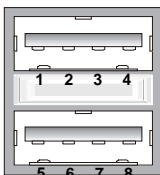
USB Port Description

1 2 3 4

5 6 7 8

USB Ports

PIN	SIGNAL	DESCRIPTION
1	VCC	+5V
2	-Data 0	Negative Data Channel 0
3	+Data0	Positive Data Channel 0
4	GND	Ground
5	VCC	+5V
6	-Data 1	Negative Data Channel 1
7	+Data 1	Positive Data Channel 1
8	GND	Ground

LAN (RJ-45) Jack

The mainboard provides 1 standard RJ-45 jack for connection to single Local Area Network (LAN). This Giga-bit LAN enables data to be transferred at 1000, 100 or 10Mbps. You can connect a network cable to it.
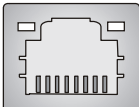
Giga-bit LAN Pin Definition

RJ-45 LAN Jack

PIN	SIGNAL	DESCRIPTION
1	D0P	Differential Pair 0+
2	D0N	Differential Pair 0-
3	D1P	Differential Pair 1+
4	D2P	Differential Pair 2+
5	D2N	Differential Pair 2-
6	D1N	Differential Pair 1-
7	D3P	Differential Pair 3+
8	D3N	Differential Pair 3-

Audio Port Connectors

The left 3 audio jacks are for 2-channel mode for stereo speaker output: **Line Out** is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is a connector for microphones.

However, there is an advanced audio application provided by Realtek CMI9880L to offer support for **7.1-channel audio operation** and can turn rear audio connectors from 2-channel to 4-/5.1-/7.1- channel audio.

S/PDIF Out-Coaxial
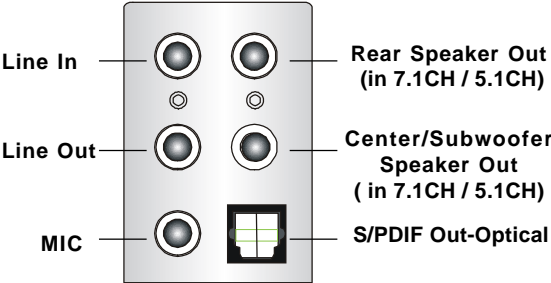
Line In

Rear Speaker Out (in 7.1CH / 5.1CH)

Line Out

Center/Subwoofer Speaker Out (in 7.1CH / 5.1CH)

MIC

S/PDIF Out-Optical

MSI Reminds You...
*For the advanced functions of the audio codec, please refer to **Chapter 7: Introduction to CMI 9880L Audio Codec** for details.*

Parallel Port Connector: LPT1

The mainboard provides a 25-pin female centronic connector as LPT. A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.
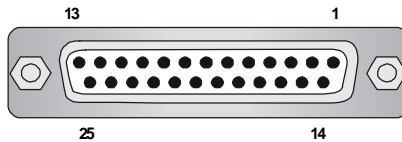
Pin Definition

PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	PaperEnd
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select In
18	GND	Ground
19	GND	Ground
20	GND	Ground
21	GND	Ground
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	GND	Ground

Connectors

The mainboard provides connectors to connect to FDD, IDE HDD, case, LAN, and USB Ports.

Floppy Disk Drive Connector: FDD1

The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.
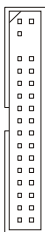
FDD1

Fan Power Connectors: CPUFAN2/SYSFAN1/NBFAN1/PWRFAN1

The CPUFAN2 (processor fan), SYSFAN1 (system fan 1), NBFAN1 (NorthBridge Chipset fan) and PWRFAN1 (power fan) support system cooling fan with +12V. It supports four/three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

GND		GND		GND		GND
+12V		+12V		+12V		+12V
SENSOR		Sensor		Sensor		NC
Control						
CPUFAN2		**SYSFAN1**		**PWRFAN1**		**NBFAN1**

MSI Reminds You...
1. *Always consult the vendors for proper CPU cooling fan.*
2. *CPUFAN2 supports the fan control. Fan/heatsink with 3 or 4 fins are both available.*
3. *Be sure to configure the* **CPU FAN PIN Select** *in BIOS for the CPU Fan you are using first. Please refer P.3-19 for details.*
4. *Please refer to the recommended CPU fans at Intel® official website.*

Hard Disk Connectors: IDE1, IDE2 & IDE3 (IDE 2 & IDE3 are optional)

The mainboard has one 32-bit Ultra DMA 66/100 IDE controller integrated in ICH6R, which supports PIO & Bus Master operation modes and it can connect up to two Ultra ATA drives.

There is also another Ultra DMA 66/100/133 IDE controller integrated in the optional VIA 6410 IDE Raid Controller, which supports RAID 0, RAID 1, RAID 0+1 and can connect up to four Ultra ATA 133 drives.

IDE1 (blue)

IDE3 (yellow)

IDE2 (yellow)
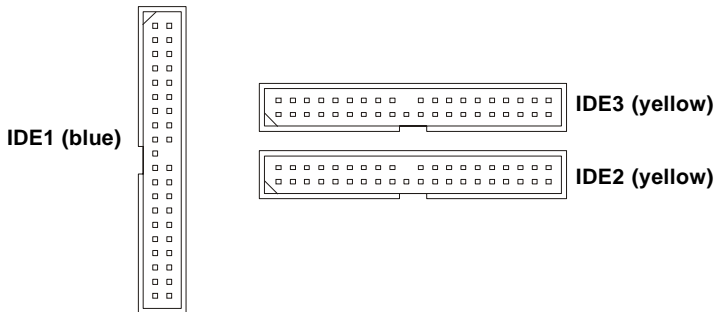
IDE1 (Primary IDE Connector)

IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

IDE2, IDE3 (Secondary and Third IDE Connector)

IDE2 & IDE3 can also connect a Master and a Slave drive.

MSI

MSI Reminds You...

If you install two hard disks on cable, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.

Serial ATA/Serial ATA RAID Connectors controlled by Intel ICH6R: SATA1~SATA4

The SouthBridge of this mainboard is Intel ICH6R which supports four serial ATA connectors SATA1~SATA4.

SATA1~SATA4 are dual high-speed Serial ATA interface ports. Each supports 1st generation serial ATA data rates of 150 MB/s. Both connectors are fully compliant with Serial ATA 1.0 specifications. Each Serial ATA connector can connect to 1 hard disk device. Please refer to the *Chapter 5: Introduction to Intel ICH6R RAID* for detail software installation procedure.

SATA4 SATA3

1

7

1

7

SATA2 SATA1
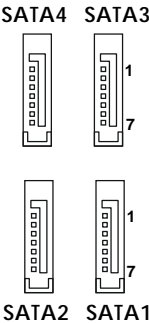
SATA1~ SATA4 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	TXP
3	TXN	4	GND
5	RXN	6	RXP
7	GND		

Serial ATA cable

Take out the dust cover and connect to the hard disk devices

Connect to serial ATA ports

MSI | **MSI Reminds You...**
Please do not fold the serial ATA cable in a 90-degree angle, since this might cause the loss of data during the transmission.

Front Panel Connectors: JFP1 & JFP2

The mainboard provides two front panel connectors for electrical connection to the front panel switches and LEDs. JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

JFP1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	HD_LED_P	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED_N	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW_N	Reset Switch low reference pull-down to GND
6	PWR_SW_P	Power Switch high reference pull-up
7	RST_SW_P	Reset Switch high reference pull-up
8	PWR_SW_N	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.

JFP2 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	SPK-
3	SLED	4	BUZ+
5	PLED	6	BUZ-
7	NC	8	SPK+

CD-In Connector: JCD1

The connector is for CD-ROM audio connector.

JCD1

L
GND
R
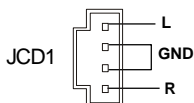
Front Panel Audio Connector: JAUD2

The JAUD2 front panel audio connector allows you to connect to the front panel audio and is compliant with Intel® Front Panel I/O Connectivity Design Guide.

9
10
1
2
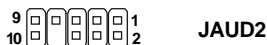
JAUD2

JAUD2 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	PORT 1L	Analog Port 1 - Left channel
2	GND	Ground
3	PORT 1R	Analog Port 1 - Right channel
4	PRESENCE#	Active low signal - signals BIOS that a High Definition Audio dongle is connected to the analog header. PRESENCE# = 0 when a High Definition Audio dongle is connected.
5	PORT 2R	Analog Port 2 - Right channel
6	SENSE1_RETIRN	Jack detection return from front panel JACK1
7	SENSE_SEND	Jack detection sense line from the High Definition Audio CODEC jack detection resistor network
8	KEY	Connector Key
9	PORT 2L	Analog Port 2 - Left channel
10	SENSE2_RETIRN	Jack detection return from front panel JACK2

FWH/LPC Debugging Pin Header: JLPC1

The pin header is for internal debugging only.

JLPC1 Pin Definition

JLPC1
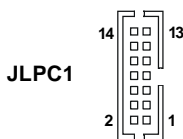
PIN	SIGNAL	PIN	SIGNAL
1	LCLK	2	Key (no pin)
3	LRST#	4	VCC3
5	LAD0	6	FID0_LRST
7	LAD1	8	VCC5
9	LAD2	10	Key (no pin)
11	LAD3	12	GND
13	LFRAME#	14	GND

Front USB Connectors: JUSB1 & JUSB2

The mainboard provides two standard USB 2.0 pin headers *JUSB1 & JUSB2* . USB 2.0 technology increases data transfer rate up to a maximum throughput of 480Mbps, which is 40 times faster than USB 1.1, and is ideal for connecting high-speed USB interface peripherals such as **USB HDD**, **digital cameras**, **MP3 players**, **printers**, **modems and the like**.
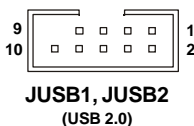
JUSB1 & JUSB2 Pin Definition

JUSB1, JUSB2
(USB 2.0)

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key (no pin)	10	USBOC

USB 2.0 Bracket

Connected to JUSB1
or JUSB2

Chassis Intrusion Switch Connector: JCI1

This connector is connected to a 2-pin chassis switch. If the chassis is opened, the switch will be short. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record.

JCI1

GND
CINTRU   1
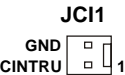
IEEE 1394 Connectors: J1394_1, J1394_2, J1394_3

The mainboard provides three 1394 pin headers that allow you to connect IEEE 1394 ports via an external IEEE1394 bracket.

Pin Definition

9   1
10   2

J1394_1~J1394_3
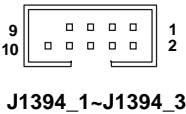
PIN	SIGNAL	PIN	SIGNAL
1	TPA+	2	TPA-
3	Ground	4	Ground
5	TPB+	6	TPB-
7	Cable power	8	Cable power
9	Key (no pin)	10	Ground

IEEE1394 Bracket

Foolproof Design

D-Bracket™ 2 Connector: JDB1

The mainboard comes with a JDB1 connector for you to connect to D-Bracket™ 2. D-Bracket™ 2 is a USB Bracket that supports both USB1.1 & 2.0 spec. It integrates four LEDs and allows users to identify system problem through 16 various combinations of LED signals.
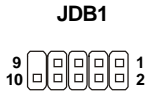
Pin Definition

Pin	Signal
1	DBG1 (high for green color)
2	DBR1 (high for red color)
3	DBG2 (high for green color)
4	DBR2 (high for red color)
5	DBG3 (high for green color)
6	DBR3 (high for red color)
7	DBG4 (high for green color)
8	DBR4 (high for red color)
9	Key
10	NC

JDB1

```
 9 |□□□□□| 1
10 |□□□□□| 2
```

D-Bracket™ 2

Connected to JDB1

Connected to JUSB1
or JUSB2

LEDs

Jumpers

The motherboard provides the following jumpers for you to set the computer's function. This section will explain how to change your motherboard's function through the use of jumpers.

Clear CMOS Jumper: JBAT1

There is a CMOS RAM on board that has a power supply from external battery to keep the system configuration data. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, use the JBAT1 (Clear CMOS Jumper) to clear data. Follow the instructions below to clear the data:

1

JBAT1

1   **1**

3   **3**

Keep Data   Clear Data
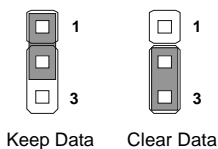
MSI   **MSI Reminds You...**
You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

Slots

The mainboard provides one PCI Express x16 slot, two PCI Express x1 slots, and three 32-bit PCI bus slots.

PCI Express Slots

The PCI Express slots, as a high-bandwidth, low pin count, serial, interconnect technology, support Intel highest performance desktop platforms utilizing the Intel Pentium 4 processor with HT Technology.

PCI Express architecture provides a high performance I/O infrastructure for Desktop Platforms with transfer rates starting at 2.5 Giga transfers per second over a PCI Express x1 lane for Gigabit Ethernet, TV Tuners, 1394 controllers, and general purpose I/O. Also, desktop platforms with PCI Express Architecture will be designed to deliver highest performance in video, graphics, multimedia and other sophisticated applications. Moreover, PCI Express architecture provides a high performance graphics (PDF, 166Kb) infrastructure for Desktop Platforms doubling the capability of existing AGP8x designs with transfer rates of 4.0 GB/s over a PCI Express x16 lane for graphics controllers, while PCI Express x1 supports transfer rate of 250 MB/s.

You can insert the expansion cards to meet your needs. When adding or removing expansion cards, make sure that you unplug the power supply first.
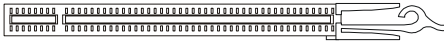
PCI Express x16 slot
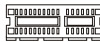
PCI Express x1 slot

PCI (Peripheral Component Interconnect) Slots

The PCI slots allow you to insert the expansion cards to meet your needs. When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to make any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

The orange PCI slot (PCI3) supports 2 masters, therefore it can also works as a communication slot. You may install the communication card on this slot, such as the wireless LAN PCI cards of MSI.
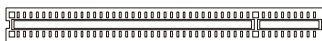
PCI Slots

PCI Interrupt Request Routing

The IRQ, acronym of interrupt request line and pronounced I-R-Q, are hard-ware lines over which devices can send interrupt signals to the microprocessor. The PCI IRQ pins are typically connected to the PCI bus INT A# ~ INT D# pins as follows:

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT A#	INT B#	INT C#	INT D#
PCI Slot 2	INT B#	INT C#	INT D#	INT A#
PCI Slot 3	INT C#	INT D#	INT A#	INT B#

3

BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use. You may need to run the Setup program when:

◈ An error message appears on the screen during the system boot up, and requests you to run SETUP.

◈ You want to change the default settings for customized features.

MSI

MSI Reminds You...
1. The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.
2. While booting up, the BIOS version is shown in the 1st line appearing after the memory count. It is usually in the format:
example: A7028IMS V1.0BH 04/23/04
where:
1st digit refers to BIOS maker as A=AMI(R); W=AWARD(R)
2nd - 5th digit refers to the model number.
6th - 7th digit refers to the customer, MS=all standard customers.
V1.0BH refers to the BIOS version.
04/23/04 refers to the date this BIOS is released.

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> key to enter Setup.

DEL: Setup Menu   TAB: Logo   F11: Boot Menu   F10: Flash Recovery

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Selecting the First Boot Device

You are allowed to select the 1st boot device without entering the BIOS setup utility by pressing <F11>. When the same message as listed above appears on the screen, press <F11> to trigger the boot menu.

The POST messages might pass by too quickly for you to respond in time. If so, restart the system and press <F11> after around 2 or 3 seconds to activate the boot menu similar to the following.

Select First Boot Device	
Floppy	: 1st Floppy
IDE-0	: IBM-DTLA-307038
CDROM	: ATAPI CD-ROM DRIVE 40X M
[Up/Dn] Select [RETURN] Boot [ESC] cancel	

The boot menu will list all the bootable devices. Select the one you want to boot from by using arrow keys and then pressing <Enter>. The system will boot from the selected device. The selection will not make changes to the settings in the BIOS setup utility, so next time when you power on the system, it will still use the original first boot device to boot up.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+>	Increase the numeric value or make changes
<->	Decrease the numeric value or make changes
<F6>	Load Optimized Defaults
<F7>	Load Fail-Safe Defaults
<F10>	Save all the CMOS changes and exit

Getting Help

After entering the Setup utility, the first screen you see is the Main Menu.

Main Menu

The main menu displays the setup categories the BIOS supplies. You can use the arrow keys (↑↓) to select the item. The on-line description for the selected setup category is displayed at the bottom of the screen.

Default Settings

The preset Optimal Defaults of the BIOS setup program provide optimal performance settings for all devices and the system.

MSI Reminds You...
The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.

The Main Menu

Once you enter AMIBIOS NEW SETUP UTILITY, the Main Menu will appear on the screen. Use arrow keys to move among the items and press <Enter> to enter the sub-menu.

```
CMOS Setup Utility - Copyright (C) 1985-2003, American Megatrends, Inc.

  ▶ Standard CMOS Features          ▶ Cell_Menu

  ▶ Advanced BIOS Features            Load Fail-Safe Defaults

  ▶ Advanced Chipset Features         Load Optimized Defaults

  ▶ Integrated Peripherals            BIOS Setting Password

  ▶ Power Management Features          Save & Exit Setup

  ▶ PNP/PCI Configurations            Exit Without Saving

  ▶ H/W Monitor


  ↑↓←→:Move  Enter:Select  +/-/:Value  F10:Save  ESC:Exit  F1:General Help
     F6:Load Optimized Defaults        F7 :Load Fail-Safe Defaults

      Load Optimized Default values for all the setup questions.

      v02.55 (C)Copyright 1985-2003, American Megatrends, Inc.
```

Standard CMOS Features
Use this menu for basic system configurations, such as time, date etc.

Advanced BIOS Features
Use this menu to setup the items of AMI® special enhanced features.

Advanced Chipset Features
Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

Power Management Features
Use this menu to specify your settings for power management.

PNP/PCI Configurations
This entry appears if your system supports PnP/PCI.

H/W/ Monitor
This entry shows the status of your CPU, fan, warning for overall system status.

Cell_Menu
Use this menu to specify your settings for frequency/voltage control.

Load Fail-Safe Defaults
Use this menu to load the default values set by the BIOS vendor for stable system performance.

Load Optimized Defaults
Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

BIOS Setting Password
Use this menu to set the password for BIOS.

Save & Exit Setup
Save changes to CMOS and exit setup.

Exit Without Saving
Abandon all changes and exit setup.

Standard CMOS Features

The items in Standard CMOS Features Menu includes some basic setup items. Use the arrow keys to highlight the item and then use the <+> or <-> keys to select the value you want in each item.

```
CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                        Standard CMOS Features

 Date (MM:DD:YY) :          [Thu 05/06/2004]        Help Item
 Time (HH:MM:SS) :          [15:11:15]
                                                Use [ENTER], [TAB]
 ▶ Primary IDE Master       [Not Detected]      or [SHIFT-TAB] to
 ▶ Primary IDE Slave        [Not Detected]      select a field.
 ▶ Secondary IDE Master     [Not Detected]
 ▶ Secondary IDE Slave      [Not Detected]      Use [+] or [-] to
 ▶ Third IDE Master         [LEMEL LDV-1648]     configure system Date.
 ▶ Third IDE Slave          [ATAPI]

 Floppy A                   [1.44 MB 3½"]

 Halt on                    [All, But Keybo]
 ▶ System Information        [Press Enter]



 ↑↓←→:Move  Enter:Select  +/-/:Value  F10:Save  ESC:Exit  F1:General Help
       F6:Load Optimized Defaults        F7 :Load Fail-Safe Defaults
```

Date (MM:DD:YY)
This allows you to set the system to the date that you want (usually the current date). The format is <day> <month> <date> <year>.

> **day**   Day of the week, from Sun to Sat, determined by BIOS. Read only.
> **month** The month from Jan. through Dec.
> **date**   The date from 1 to 31 can be keyed by numeric function keys.
> **year**   The year can be adjusted by users.

Time (HH:MM:SS)
This allows you to set the system time that you want (usually the current time). The time format is <hour> <minute> <second>.

Primary/Secondary/Third IDE Master/Slave
Press <+> or <-> to select the hard disk drive type. The specification of hard disk drive will show up on the right hand according to your selection. Press <Enter> for the sub-menu of each item:

```
CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                         IDE Primary Master

 IDE Primary Master                              Help Item

 Device    :Not Detected                     Disabled: Disables LBA
                                             Mode.
 LBA/Large Mode          [Auto]              Auto: Enables LBA
 DMA Mode                [Auto]              Mode if the device
 Hard Disk S.M.A.R.T.    [Auto]              supports it and the
                                             device is not already
                                             formatted with LBA
                                             Mode disabled.
```

Device
This item shows the information about the specified item. Read-only.

LBA/Large Mode
This item allows you to enable or disable the LBA (Logical Block Address, the logical block size in hard disk) mode. Setting options: [Auto], [Disabled].

DMA Mode
This item allows you to enable or disable the DMA (Direct Memory Access) mode. Setting options: [Auto], [Disabled], [UDMA0], [UDMA1], [UDMA2], [UDMA3], [UDMA4], [UDMA5].

Hard Disk S.M.A.R.T.
This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline. Settings: [Auto], [Enabled], [Disabled].

Floppy A
This item allows you to set the type of the floppy drives installed. Available options: [Disabled], [360 KB, 5$^{1/4}$], [1.2 MB, 5$^{1/4}$], [720 KB, 3 $^{1/2}$], [1.44 MB, 3 $^{1/2}$], [2.88MB, 3 $^{1/2}$].

Halt On
The setting determines whether the system will stop if an error is detected at boot. Available options are:

[No Errors]	The system doesn't stop for any detected error.
[All, But Keyboard]	The system doesn't stop for a keyboard error.

System Information
Press <Enter> to for the sub-menu of each item:


```
CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                         System Information

Total System Memory    504MB                    Help Item
BIOS Version           V1.0B0

            ** CPU Information **

Genuine Intel(R) CPU 3.20GHz
CPU ID/uCode ID   0F34h/0Bh
CPU Frequency     3.20GHz (200x16)
```
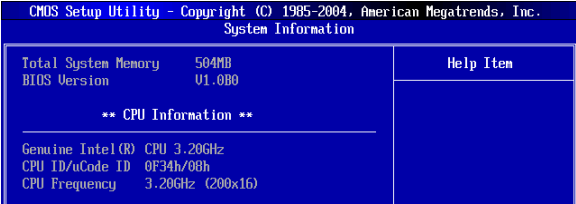
Total Memory/BIOS Version
This item shows the memory status and BIOS version of your system (read only).

CPU Information
Genuine Intel (R)/CPU ID/uCode ID/CPU Frequency
The three items show the CPU related information of your system (read only).

Advanced BIOS Features

```
          CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                            Advanced BIOS Features

   Quick Boot                        [Enabled]              Help Item
   Boot Sector Protection            [Disabled]
   Boot to OS/2                      [No]             Allows BIOS to skip
   Hyper-Threading Function          [Enabled]        certain tests while
   IOAPIC Function                   [Enabled]        booting. This will
   MPS Table Version                 [1.4]            decrease the time
   Full Screen LOGO Display          [Enabled]        needed to boot the
 ▶ Boot Sequence                     [Press Enter]    system.




      ↑↓←→:Move  Enter:Select  +/-/:Value  F10:Save  ESC:Exit  F1:General Help
          F6:Load Optimized Defaults           F7 :Load Fail-Safe Defaults
```

Quick Boot
Setting the item to [Enabled] allows the system to boot within 5 seconds since it will skip some check items. Available options: [Enabled], [Disabled].

Boot Sector Protection
This function protects the BIOS from accidental corruption by unauthorized users or computer viruses. When enabled, the BIOS' data cannot be changed when attempting to update the BIOS with a Flash utility. To successfully update the BIOS, you'll need to disable this Boot Sector Protection function.
You should enable this function at all times. The only time when you need to disable it is when you want to update the BIOS. After updating the BIOS, you should immediately re-enable it to protect it against viruses. Setting options: [Enabled], [Disabled].

Boot to OS/2
This allows you to run the OS/2® operating system with DRAM greater than 64MB. Setting options: [Yes], [No].

Hyper-Threading Technology
The processor uses Hyper-Threading technology to increase transaction rates and reduces end-user response times. The technology treats the two cores inside the processor as two logical processors that can execute instructions simultaneously. In this way, the system performance is highly improved. If you disable the function, the processor will use only one core to execute the instructions. Settings: [Enabled], [Disabled].

> **MSI Reminds You...**
> *Enabling the functionality of Hyper-Threading Technology for your com-*
> *puter system requires ALL of the following platform Components:*
> * **CPU:** *An Intel® Pentium® 4 Processor with HT Technology;*
> * **Chipset:** *An Intel® Chipset that supports HT Technology;*
> * **BIOS:** *A BIOS that supports HT Technology and has it*
> *enabled;*
> * **OS:** *An operating system that supports HT Technology.*
> *For more information on Hyper-threading Technology, go to:*
> *www.intel.com/info/hyperthreading*

IOAPIC Function
This field is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance with PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQ resources for the system. Settings: [Enabled], [Disabled].

MPS Table Version
This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system. Settings: [1.4], [1.1].

Full Screen LOGO Display
This item enables you to show the company logo on the bootup screen. Settings are:

    [Enabled]   Shows a still image (logo) on the full screen at boot.

    [Disabled]   Shows the POST messages at boot.

Boot Sequence
Press <Enter> and the following sub-menu appears.

```
CMOS Setup Utility - Copyright (C) 1985-2003, American Megatrends, Inc.
                            Boot Sequence

1st Boot Device        [1st FLOPPY DRIVE]      Help Item
2nd Boot Device        [HDD:PM-ST320414A]
3rd Boot Device        [CD/DVD:SS-ATAPI-CD]  Specifies the boot
Boot From Other Device [Yes]                 sequence from the
                                             available devices
```

1st/2nd/3rd Boot Device
These items allow you to set the sequence of boot devices where AMIBIOS attempts to load the operating system.

> **MSI Reminds You...**
> *Available settings for "**1st/2nd/3rd Boot Device**" vary depending on*
> *the bootable devices you have installed. For example, if you did not*
> *install a floppy drive, the setting "Floppy" will not show up.*

Boot From Other Devices
Setting the option to [Yes] allows the system to try to boot from other devices if the system fails to boot from the 1st/2nd/3rd boot device. Settings are: [Yes], [No].

Advanced Chipset Features

```
CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                         Advanced Chipset Features

 Configure DRAM Timing by SPD    [Enabled]          Help Item
 Memory Hole                     [Disabled]
 Int. Gfx Memory Size Select     [Enabled, 8MB]
 Aperture Size Select            [256MB]
 PEG Port                        [Enabled]

↑↓←→:Move  Enter:Select  +/-/:Value  F10:Save  ESC:Exit  F1:General Help
      F6:Load Optimized Defaults           F7 :Load Fail-Safe Defaults
```
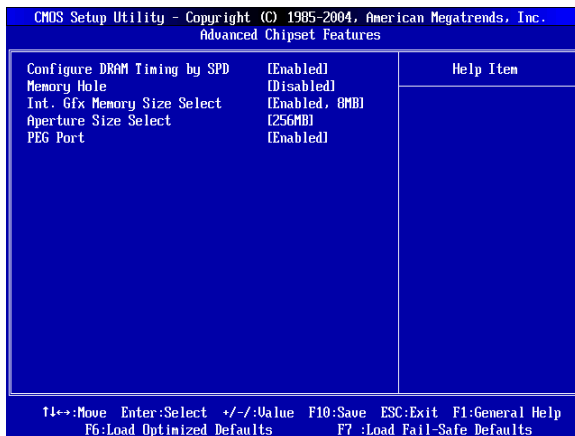
MSI Reminds You...
Change these settings only if you are familiar with the chipset.

Configure DRAM Timing by SPD
Selects whether DRAM timing is controlled by the SPD (Serial Presence Detect) EEPROM on the DRAM module. Setting to [Auto By SPD] enables DRAM timings and the following related items to be determined by BIOS based on the configurations on the SPD. Selecting [Manual] lets users configure the DRAM timings and the following related items manually. Setting options: [Manual], [Auto By SPD], [Turbo], [Ultra].

Memory Hole
In order to improve performance, certain space in memory can be reserved for ISA peripherals. This memory must be mapped into the memory space below 16MB. When this area is reserved, it cannot be cached. Settings: [Disabled], [15MB-16MB].

Int. Gfx Memory Size Select
The field specifies the size of system memory allocated for video memory. Setting options: [Disabled], [Enabled, 1MB], [Enabled, 4MB], [Enabled, 8MB], [Enabled, 16MB], [Enabled, 32MB].

Aperture Size Select
This setting controls just how much system RAM can be allocated to PEG (PCI Express Graphic) for video purposes. The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the PEG without any translation. The option allows the selection of an aperture size of [128MB], and [256 MB].

PEG Port
This item enables or disables the PEG (PCI Express Graphic) port function. Setting options: [Enabled], [Disabled].

Integrated Peripherals

```
CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                         Integrated Peripherals

 USB Controller                    [Enabled]            Help Item
 USB Device Legacy Support         [Auto]
 Onboard LAN Controller            [Enabled]        Enables USB host
  Onboard LAN Option ROM           [Disabled]       controllers.
 Onboard IEEE1394 Controller       [Enabled]
 Onboard IDE RAID Controller       [Enabled]
 Onboard Audio Controller          [Enabled]
 ▶ IDE Devices Configuration       [Press Enter]
 ▶ I/O Devices Configuration       [Press Enter]
 ▶ SATA Devices Configuration      [Press Enter]




 ↑↓←→:Move  Enter:Select  +/-/:Value  F10:Save  ESC:Exit  F1:General Help
           F6:Load Optimized Defaults      F7 :Load Fail-Safe Defaults
```

USB Controller
This setting is used to enable/disable the onboard USB host controller. Setting options: [Disabled], [Enabled].

USB Device Legacy Support
Set to [Enabled] if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS. Set to [Disabled] only if you want to use any USB device other than the USB mouse. Setting options: [Disabled], [Enabled], [Auto].

Onboard LAN Controller
The item enables or disables the onboard LAN controller. Setting options: [Enabled], [Disabled].

Onboard LAN Option ROM
The item enables or disables the initialization of the onboard LAN Boot ROMs during bootup. Selecting [Disabled] will speed up the boot process. Setting options: [Enabled], [Disabled].

OnBoard IEEE1394 Controller
This setting is used to enable/disable the onboard IEEE 1394 controller. Setting options: [Enabled], [Disabled].

Onboard IDE RAID Controller
This allows you to enable or disable onboard IDE RAID controller. The field is optional. It appears only when your mainboard supports IDE RAID function. Setting options: [Enabled], [Disabled].

Onboard Audio Controller
This item is used to enable or disable the onboard Azalia (Audio Codec) controller. Selecting [Enabled] allows the mainboard to enable the onboard Azalia controller. Disable the function if you want to use other controller cards to connect an audio device. Settings: [Disabled] and [Enabled]**.**

IDE Devices Configuration
Press <Enter> to enter the sub-menu and the following screen appears:

```
CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                      IDE Devices Configuration

PCI IDE BusMaster              [Disabled]              Help Item
```

PCI IDE BusMaster
Set this option to [Enabled] to specify that the IDE controller on the PCI local bus has bus mastering capability. Settings options: [Disabled], [Enabled].

I/O Devices Configuration
Press <Enter> to enter the sub-menu and the following screen appears:

```
CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                      I/O Devices Configuration

OnBoard Floppy Controller     [Enabled]              Help Item
COM Port 1                    [3F8/IRQ4]
Parallel Port                 [3BC]                  Allows BIOS to Enable
Parallel Port Mode            [Bi-Directional]       or Disable Floppy
Parallel Port IRQ             [IRQ7]                  Controller.
```

OnBoard Floppy Controller
Select [Enabled] if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it.

Option	Description
[Enabled]	Enables the onboard Floppy controller.
[Disabled]	Disables the onboard Floppy controller.

COM Port 1
This item specifies the base I/O port addresses of the onboard Serial Port 1 (COM 1). Selecting [Auto] allows AMIBIOS to automatically determine the correct base I/O port address. Settings: [3F8/IRQ4], [2F8/IRQ3], [3E8/IRQ4], [2E8/IRQ3] and [Disabled].

Parallel Port
This field specifies the base I/O port address of the onboard parallel port. Selecting [Auto] allows AMIBIOS to automatically determine the correct base I/O port address. Settings: [378], [278], [3BC] and [Disabled].

Parallel Port Mode
This item selects the operation mode for the onboard parallel port: [ECP], [Normal] or [Bi-Dir].

Parallel Port IRQ
This item allows you to set parallel port IRQ. Setting options: [IRQ5], [IRQ7].

SATA Devices Configuration
Press <Enter> to enter the sub-menu and the following screen appears:

```
CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                      SATA Devices Configuration

 ATA/IDE Configuration        [Enhanced]          Help Item
    Configure SATA as          [IDE]
                                                    Options

                                                 Disabled
                                                 Compatible
                                                 Enhanced
```

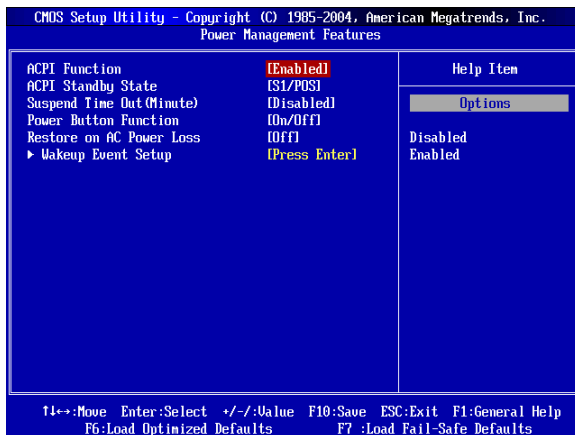**ATA/IDE Configuration, Configure SATA as**
These 2 items allow you to select the ATA/IDE and SATA configuration. Select [Disabled] in ***ATA/IDE Configuration*** if you want to disable both ATA/IDE configuration. Select [Compatible] or [Enhanced] to use the IDE, S-ATA and P-ATA devices. Refer to the following tables for details.

	ATA/IDE Configuration (Compatible)
SATA Only	*[SATA 1/3/2/4]*
PATA Pri, SATA Sec	*[IDE1, SATA2/4]*
SATA Pri, PATA Sec	*[SATA1/3, IDE1]*
PATA Only	*[IDE1]*

	ATA/IDE Configuration (Enhanced)
IDE	*[IDE1, SATA 1/2/3/4]*
AHCI	*[IDE1, SATA 1/2/3/4]*
RAID	*[IDE1, SATA 1/2/3/4], [SATA support RAID 0 or 1]*

For the setting options of ***Configure SATA as***, select [IDE] if you want to have SATA as IDE function. Select [AHCI] to allow the SATA having Advanced Host Controller Interface (AHCI) feature, which supports improved serial ATA disk performance with native command queuing & native hot plug. Select [RAID] to use SATA as RAID function. Setting options: [IDE], [AHCI], [RAID].

Power Management Features

```
CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                        Power Management Features

 ACPI Function                 [Enabled]          Help Item
 ACPI Standby State            [S1/POS]
 Suspend Time Out(Minute)      [Disabled]          Options
 Power Button Function         [On/Off]
 Restore on AC Power Loss      [Off]            Disabled
 ▶ Wakeup Event Setup          [Press Enter]    Enabled




 ↑↓←→:Move  Enter:Select  +/-/:Value  F10:Save  ESC:Exit  F1:General Help
           F6:Load Optimized Defaults       F7 :Load Fail-Safe Defaults
```

MSI Reminds You...
S3-related functions described in this section are available only when your BIOS supports S3 sleep mode.

ACPI Function
This item is to activate the ACPI (Advanced Configuration and Power Management Interface) Function. If your operating system is ACPI-aware, such as Windows 98SE/2000/ME/XP, select [Enabled]. Settings: [Enabled] and [Disabled].

ACPI Standby State
This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 98SE, Windows ME, Windows 2000 and Windows XP, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field. Options are:

[S1/POS]   The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system context.

[S3/STR]   The S3 sleep mode is a lower power state where the information of system configuration and open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a "wake up" event occurs.

[Auto]   BIOS determines the best setting automatically.

Suspend Time Out (Minute)
If system activity is not detected for the length of time specified in this field, all devices except CPU will be shut off. Settings: [Disabled], [1], [2], [4], [8], [10], [20], [30], [40], [50], [60].

Power Button Function
This feature allows users to configure the Power Button function. Settings are:

[Power Off]   The power button functions as a normal power-on/-off button.

[Suspend]   When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.
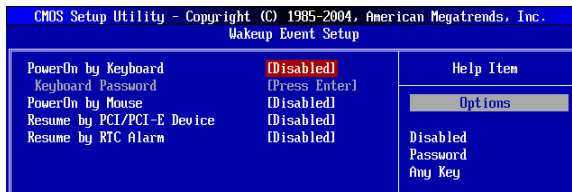
Restore on AC/Power Loss
This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

[Off]   Leaves the computer in the power off state.

[On]   Leaves the computer in the power on state.

[Last State]   Restores the system to the previous status before power failure or interrupt occurred.

Wakeup Event Setup
Press <Enter> and the following sub-menu appears.

```
 CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                         Wakeup Event Setup

 PowerOn by Keyboard           [Disabled]          Help Item
   Keyboard Password           [Press Enter]
 PowerOn by Mouse              [Disabled]            Options
 Resume by PCI/PCI-E Device    [Disabled]
 Resume by RTC Alarm           [Disabled]        Disabled
                                                 Password
                                                 Any Key
```

PowerOn by Keyboard
This controls how and whether the PS/2 keyboard is able to power on the system. If you choose [Password], the power button on the case will not function anymore and you must type the password to power on the system. Settings: [Disabled], [Password] and [Any Key].

Keyboard Password
If *PowerOn by Keyboard* is set to [Password], then you can set a password in the field for the PS/2 keyboard to power on the system.

PowerOn by Mouse
The setting determines whether the system will be awakened from power saving modes when the PS/2 mouse input signal is detected. Setting options: [Disabled], [Any Key], [Left Button], [Right Button].

Resume by PCI/PCI-E Device
This controls how and whether the system can be powered on by the devices installed on PCI/PCI-E slots. Setting options: [Disabled], [Enabled].

Resume On RTC Alarm
This is used to enable or disable the feature of booting up the system on a scheduled time/date from the S3, S4, and S5 power off state. Setting options: [Disabled], [Enabled].

Date/Time (HH:MM:SS)
If *Resume By RTC Alarm* is set to [Enabled], the system will automatically resume (boot up) on a specific date/hour/minute/second specified in these fields (using the <+> and <-> to select the date & time settings). Available settings for each item are:

Date   *01 ~ 31, Every Day*
Time (HH:MM:SS)   *00 ~ 23 : 00 ~ 59 : 00 ~ 59*

MSI Reminds You...
If you have changed this setting, you must let the system boot up until it enters the operating system, before this function will work.

PNP/PCI Configurations

This section describes configuring the PCI bus system and PnP (Plug & Play) feature. PCI, or **P**eripheral **C**omponent **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

```
CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                         PNP/PCI Configurations

 Clear ESCD                   [No]              Help Item
 Graphic Adapter Priority     [PEG/IGD]
 PCI Latency Timer            [64]          NO: lets the BIOS
 PCI Slot1 IRQ                [Auto]        configure all the
 PCI Slot2 IRQ                [Auto]        devices in the system.
 PCI Slot3 IRQ                [Auto]        YES: lets the
 ▶ IRQ Resource Setup         [Press Enter] operating system
 ▶ DMA Resource Setup         [Press Enter] configure Plug and
                                            Play (PnP) devices not
                                            required for boot if
                                            your system has a Plug
                                            and Play operating
                                            system.




 ↑↓←→:Move  Enter:Select  +/-/:Value  F10:Save  ESC:Exit  F1:General Help
           F6:Load Optimized Defaults         F7 :Load Fail-Safe Defaults
```

Clear ESCD
The ESCD (Extended System Configuration Data) NVRAM (Non-volatile Random Access Memory) is where the BIOS stores resource information for both PNP and non-PNP devices in a bit string format. When the item is set to [Yes], the system will reset ESCD NVRAM right after the system is booted up and then set the setting of the item back to [No] automatically.

Graphic Adapter Priority
This setting specifies which VGA card is your primary graphics adapter. Setting options are:

[IGD] The system initializes the IGD (internal graphic display) first. (for 915G only)

[PEG/IGD] The system initializes the PEG (PCI Express graphic) first. If a PCI Express graphic card is not available, it will initialize the IGD. (for 915G only)

[PEG/PCI] The system initializes the PEG (PCI Express graphic) first. If a PCI Express graphic card is not available, it will initialize the PCI graphic card.

[PCI/PEG] The system initializes the PCI graphic card first. If a PCI graphic card is not available, it will initialize the PEG (PCI Express graphic) card.

[PCI/IGD] The system initializes the PCI graphic card first. If a PCI graphic card is not available, it will initialize the IGD. (for 915G only)

PCI Latency Timer
This item controls how long each PCI device can hold the bus before another takes

over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. For better PCI performance, you should set the item to higher values. Setting options: [32], [64], [96], [128], [160], [192], [224], [248].

PCI Slot1 IRQ, PCI Slot2 IRQ, PCI Slot3 IRQ
These items specify the IRQ line for each PCI slot. Setting options: [3], [4], [5], [7], [9], [10], [11], [12], [14], [15], [Auto]. Selecting [Auto] allows BIOS to automatically determine the IRQ line for each PCI slot.

IRQ Resource Setup
Press <Enter> and the following sub-menu appears.

```
CMOS Setup Utility - Copyright (C) 1985-2003, American Megatrends, Inc.
                         IRQ Resource Setup

  IRQ3              [Available]              Help Item
  IRQ4              [Available]
  IRQ5              [Available]              Options
  IRQ7              [Available]
  IRQ9              [Available]           Available
  IRQ10             [Available]           Reserved
  IRQ11             [Available]
  IRQ14             [Available]
  IRQ15             [Available]
```

IRQ 3/4/5/7/9/10/11/14/15
These items specify the bus where the specified IRQ line is used.
The settings determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the IRQ pool, the end user can use these settings to reserve the IRQ by assigning an [Reserved] setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as [Available]. If all IRQs are set to [Reserved], and IRQ 14/15 are allocated to the onboard PCI IDE, IRQ 9 will still be available for PCI and PnP devices. Available settings: [Reserved] and [Available].

DMA Resource Setup
Press <Enter> and the following sub-menu appears.

```
CMOS Setup Utility - Copyright (C) 1985-2003, American Megatrends, Inc.
                         DMA Resource Setup

  DMA Channel 0         [Available]           Help Item
  DMA Channel 1         [Available]
  DMA Channel 3         [Available]           Options
  DMA Channel 5         [Available]
  DMA Channel 6         [Available]        Available
  DMA Channel 7         [Available]        Reserved
```
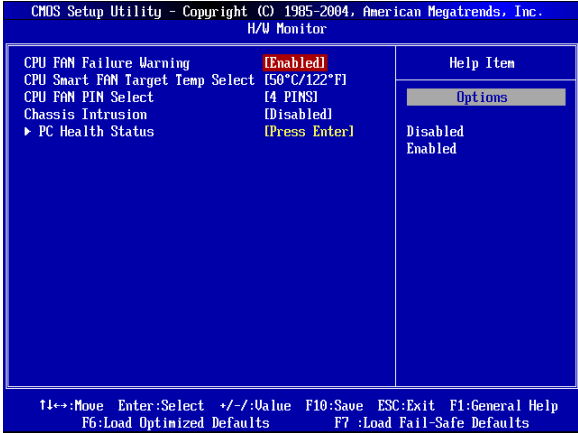
DMA Channel 0/1/3/5/6/7
These items specify the bus that the system DMA (Direct Memory Access) channel is used.
The settings determine if AMIBIOS should remove a DMA from the available DMAs passed to devices that are configurable by the system BIOS. The available DMA pool is determined by reading the ESCD NVRAM. If more DMAs must be removed from the pool, the end user can reserve the DMA by assigning [Reserved] setting to it.

H/W Monitor

This section shows the status of your CPU, fan, overall system status, etc. Monitor function is available only if there is hardware monitoring mechanism onboard.

```
         CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                                    H/W Monitor
  ┌─────────────────────────────────────────────────┬─────────────────────┐
  │ CPU FAN Failure Warning          [Enabled]       │     Help Item       │
  │ CPU Smart FAN Target Temp Select [50°C/122°F]    ├─────────────────────┤
  │ CPU FAN PIN Select               [4 PINS]        │      Options        │
  │ Chassis Intrusion                [Disabled]      │                     │
  │ ▶ PC Health Status               [Press Enter]   │   Disabled          │
  │                                                  │   Enabled           │
  │                                                  │                     │
  │                                                  │                     │
  │                                                  │                     │
  │                                                  │                     │
  │                                                  │                     │
  │                                                  │                     │
  │                                                  │                     │
  │                                                  │                     │
  │                                                  │                     │
  └─────────────────────────────────────────────────┴─────────────────────┘
     ↑↓←→:Move  Enter:Select  +/-/:Value  F10:Save  ESC:Exit  F1:General Help
           F6:Load Optimized Defaults       F7 :Load Fail-Safe Defaults
```

CPU Fan Failure Warning
When enabled, the system will automatically monitor the CPU fan during boot-up. If it detects that the CPU fan is not rotating, the system will show an error message on the screen and halt the boot-up process. The function is **built with CPU fan power connector (CPUFAN2) only** and enables you to protect the CPU from possible overheating problem. If you don't connect the CPU fan to the CPU fan power connector, we recommend disabling this feature. Setting options: [Enabled], [Disabled].

CPU Smart Fan Target Temp Select
When the current temperature of the CPU fan reaches the value you specify here, the CPU fan will speed up for cooling down to avoid the CPU damage; on the contrary, if the CPU fan current temperature is lower than the specified value, the CPU fan will slow down its speed to keep the temperature stable.

CPU FAN PIN Select
If you enable the *CPU Smart Fan Target Temp Select*, this item is available for you to choose the CPU fan pin number of your system. Be sure to select the correct pin number identical to the pin of the CPU fan you purchase. Setting options: [3 PINS], [4 PINS].

Chassis Intrusion
The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. This item is available only when your mainboard has JCI1 jumper. To clear the warning message, set the field to [Reset]. The setting of the field will automatically return to [Enabled] later. Settings: [Enabled], [Reset], [Disabled].

PC Health Status
Press <Enter> and the following sub-menu appears.

```
      CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                              PC Health Status

   CPU Temperature            : 51°C/123°F          │    Help Item
   System Temperature         : 34°C/93°F           │
   CPU FAN Speed              : 2576 RPM            │
   SYSTEM FAN Speed           : 0 RPM               │
   POWER FAN Speed            : 0 RPM               │
   Vcore                      : 1.376 V             │
   +3.3V                      : 3.354 V             │
   +5.0V                      : 5.022 V             │
   +12.0V                     : 11.762 V            │
   +5VSB                      : 5.052 V             │
```

CPU/System Temperature, CPU/System/Power FAN Speed, Vcore, +3.3 V, +5.0 V, +12.0V, +5VSB
These items display the current status of all of the monitored hardware devices/components such as CPU voltages, temperatures and all fans' speeds.

Cell Menu

The items in Cell Menu includes some important settings of CPU, AGP, DRAM and overclocking functions.

```
CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.
                              Cell_Menu

 Current CPU Clock                 3400MHz              Help Item
 Current DDR Memory Frequency      533MHz
                                                         Options
 High Performance Mode            [Optimized]
 Dynamic Overclocking             [Disabled]       Optimized
 Adjust CPU FSB Frequency         [200]            Manual
 CPU Ratio CMOS Setting           [ 17]
  Adjusted CPU CLOCK              [3400]
 Adjust DDR Memory Frequency      [Auto]
  Adjusted DDR Memory Frequency   [533]
 Adjust PCI Frequency             [33.3]
 Adjust PCI Express Frequency     [100]
 Adjust CPU Voltage (V)           [1.3875]
 Adjust DDR Voltage (V)           [1.85]
 Adjust NB Voltage (V)            [1.55]
 Spread Spectrum                  [Enabled]


 ↑↓↔:Move  Enter:Select  +/-/:Value  F10:Save  ESC:Exit  F1:General Help
          F6:Load Optimized Defaults        F7 :Load Fail-Safe Defaults
```

MSI

MSI Reminds You...
Change these settings only if you are familiar with the chipset.

Current CPU CLOCK, Current DDR Memory Frequency
These two items show the current clocks of CPU & DDR memory frequency. Read-only.

High Performance Mode
This field allows you to select the DDR timing setting. Setting to [Optimized] enables *Adjust DDR Memory Frequency* automatically to be determined by SPD. Selecting [Manual] allows users to configure these fields manually. Setting options: [Optimized], [Manual].

Dynamic OverClocking
Dynamic Overclocking Technology is the automatic overclocking function, included in the MSI™'s newly developed CoreCell™ Technology. It is designed to detect the load balance of CPU while running programs, and to adjust the best CPU frequency automatically. When the motherboard detects CPU is running programs, it will speed up CPU automatically to make the program run smoothly and faster. When the CPU is temporarily suspending or staying in the low load balance, it will restore the default settings instead. Usually the Dynamic Overclocking Technology will be powered only when users' PC need to run huge amount of data like 3D games or the video process, and the CPU frequency need to be boosted up to enhance the overall performance. Setting options:

[Disabled]   Disable Dynamic Overclocking function.
[Private]   1st level of overclocking, increasing the CPU frequency by 1%.
[Sergeant]   2nd level of overclocking, increasing the CPU frequency by 3%.
[Captain]   3rd level of overclocking, increasing the CPU frequency by 5%.
[Colonel]   4th level of overclocking, increasing the CPU frequency by 7%.
[General]   5th level of overclocking, increasing the CPU frequency by 10%.
[Commander] 6th level of overclocking, increasing the CPU frequency by 15%.

MSI Reminds You...

1. Even though the Dynamic Overclocking Technology is more stable than manual overclocking, basically, it is still risky. We suggest user to make sure that your CPU can afford to overclock regularly first. If you find the PC appears to be unstable or reboot incidentally, it's better to disable the Dynamic Overclocking or to lower the level of overclocking options. By the way, if you need to conduct overclocking manually, you also need to disable the Dynamic OverClocking first.

2. Meanwhile, there are two functions to protect user's system from crashing.
     - There is a safe key "Ins" in BIOS. In case the overclocking fails, you can press "Ins" key while system rebooting to restore to the BIOS defaults.
     - If the system incidentally reboot for four times, the BIOS will also be restored to the defaults.

Adjust CPU FSB Frequency
This item allows you to select the CPU Front Side Bus clock frequency (in MHz) and overclock the processor by adjusting the FSB clock to a higher frequency. Setting options: For CPU FSB200: [200]~[500]
                 For CPU FSB133: [133]~[500]

CPU Ratio CMOS Setting
This item allows you to adjust the CPU ratio. Setting to [Startup] enables the CPU running at the fastest speed which is detected by system.

Adjusted CPU Clock
This read-only item shows the CPU Clock you like to use, which will automatically change in accordance with the settings of *Adjust CPU FSB Frequency* and *CPU Ratio CMOS Setting*. Please note you must reboot the system to let the change take effect.

Adjust DDR Memory Frequency
When it is set to [Manual] in *High Performance Mode*, user can place an artificial memory clock limit on the system. Please note that memory is prevented from running faster than this frequency. Setting options: [Auto], [400], [533], [667].

Adjusted DDR Memory Frequency
This read-only item shows the DDR Memory Frequency you like to use, which will

automatically change in accordance with the setting of *Adjust DDR Memory Frequency*. Please note you must reboot the system to let the change take effect.

Adjust PCI Frequency
This item allows you to select the PCI frequency (in MHz). In default this value will change automatically in accordance with the setting of *CPU Ratio CMOS Setting*. However, you may adjust the desired PCI frequency you like by using the <+> & <-> key. Setting options: [33.3], [37.7], [40.0].

Adjust PCI Express Frequency
This item allows you to select the PCI Express frequency (in MHz). Select the number between [100]~[133] for needed frequency.

Adjust CPU Voltage (V)
The settings are used to adjust the CPU clock multiplier (ratio) and CPU core voltage (Vcore). These settings offer users a tool to overclock the system.

Adjust DDR Voltage (V)
Adjusting the DDR voltage can increase the DDR speed. Any changes made to this setting may cause a stability issue, so *changing the DDR voltage for long-term purpose is NOT recommended*.

Adjust NB Voltage (V)
NorthBridge voltage is adjustable in the field, allowing you to increase the performance of your NorthBridge when overclocking, but stability may be affected.

> **MSI** **MSI Reminds You...**
> *The settings shown in different color in CPU Voltage, DDR Voltage and NB Voltage help to verify if your setting is proper for your system.*
> **Gray: Default setting.**
> **White: Safe setting.**
> **Yellow: High performance setting.**
> **Red: Not recommended setting and the system may be unstable.**
> *Changing CPU Voltage, DDR Voltage and NB Voltage may result in the instability of the system; therefore, it is **NOT** recommended to change the default setting for long-term usage.*

Spread Spectrum
When the motherboard's clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The *Spread Spectrum* function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves. If you do not have any EMI problem, leave the setting at [Disabled] for optimal system stability and performance. But if you are plagued by EMI, activate the *Spread Spectrum* for EMI reduction. Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clock speed which may just cause your overclocked processor to lock up. Options: [Disabled], [Enabled].

BIOS Setting Password

When you select this function, a message as below will appear on the screen:

```
CMOS Setup Utility - Copyright (C) 1985-2004, American Megatrends, Inc.

  ▶ Standard CMOS Features          ▶ Cell_Menu

  ▶ Advanced BIOS Features            Load Fail-Safe Defaults

  ▶ Advanced Chipset Features         Load Optimized Defaults

  ▶ Integrated Peripherals            BIOS Setting Password

  ▶ Power Management Fea  Enter Password:      xit Setup

  ▶ PNP/PCI Configurations            Exit Without Saving

  ▶ H/W Monitor


  ↑↓←→:Move  Enter:Select  +/-/:Value  F10:Save  ESC:Exit  F1:General Help
    F6:Load Optimized Defaults           F7 :Load Fail-Safe Defaults

               Set Time, Date, Hard Disk Type ...

        v02.56 (C)Copyright 1985-2004, American Megatrends, Inc.
```

Type the password, up to six characters in length, and press <Enter>. The password typed now will replace any previously set password from CMOS memory. You will be prompted to confirm the password. Retype the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.
To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.
When a password has been set, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Load Fail-Safe/Optimized Defaults

The two options on the main menu allow users to restore all of the BIOS settings to the default Fail-Safe or Optimized values. The Optimized Defaults are the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard. The Fail-Safe Defaults are the default values set by the BIOS vendor for stable system performance.

When you select Load Fail-Safe Defaults, a message as below appears:

Load Fail-Safe Defaults?

[Ok]   [Cancel]

Pressing *Y* loads the BIOS default values for the most stable, minimal system performance.

When you select Load Optimized Defaults, a message as below appears:

Load Optimized Defaults?

[Ok]   [Cancel]

Pressing *Y* loads the default factory settings for optimal system performance.

Introduction to DigiCell

DigiCell, the most useful and powerful utility that MSI has spent much research and efforts to develop, helps users to monitor and configure all the integrated peripherals of the system, such as audio program, power management, MP3 files management and communication / 802.11g WLAN settings. Moreover, with this unique utility, you will be able to activate the MSI well-known features, Live Update and Core Center, which makes it easier to update the BIOS/drivers online, and to monitor the system hardware status (CPU/Fan temperature and speed) or to overclock the CPU/memory.

Once you have your DigiCell installed (locate the setup source file in the setup CD accompanying with your mainboard, path: **Utility --> MSI Utility --> MSI DigiCell**), it will have an icon ![icon] in the system tray, a short cut icon on the desktop, and a short cut path in your "Start-up" menu. You may double-click on each icon to enable DigiCell.

short-cut icon in the system tray

short-cut path in the start-up menu
(path: Start-->Programs-->MSI-->DigiCell)

Main

Before using this utility, it is required to have all the integrated peripherals/cards (LAN card, Wireless LAN card, MegaStick... etc.) and all the necessary drivers (onboard LAN driver, audio driver, CoreCenter, Live Update... etc.) installed correctly.

The icon representing each item will be lit up if it is inserted/installed correctly and properly. Otherwise, the icon will remain gray and user is not able to view the functionality/connection of that item.

Introduction:

Click on each icon appearing above to enter the sub-menu to make further configuration.

> ### *MSI*
> Click on this button to link to MSI website:
> http://www.msi.com.tw.
>
> ### *Quick Guide*
> Click on this button and the quick guide of **DigiCell** will be displayed for you to review.
>
> ### *H/W Diagnostic*
> In this sub-menu, it provides the information of each DigiCell button for you to check if the representing peripherals/cards/drivers are correctly installed.
>
> ### *Comm.*
> In this sub-menu, you can see the configuration details for communication products, including the status, strength, speed and channel of the connection of the Ethernet LAN & Wireless LAN.
>
> ### *Software Access Point*
> In this sub-menu, you can change your connection mode, and configure the advanced settings for each mode, such as the authentication encryption... etc.

Live Update
You can take advantage of **Live Update** to detect and update BIOS and drivers online.

Core Center
You can take advantage of **Core Center** to monitor the health status of your system and to overclock under Windows OS if your system supports overclocking function.

MEGA STICK
If you have your MEGA STICK connected to your system, this icon will be lit up. Click this blue icon to turn DigiCell into a MP3 player, and then you can load media files from your MEGA STICK or the system, and edit the preferred playlist.

Audio Speaker Setting
In this sub-menu, you can configure and test the multi-channel audio function, speakers, sound effect and environment.

Power on Agent
In this sub-menu, you can configure date, time and auto-executed programs of the power-on, power-off and restarting features.

MSI Reminds You...
*Click on **back** button in every sub-menu and it will bring you back to the main menu.*

H/W Diagnostic

In the **H/W Diagnostic** sub-menu, you can see the information, status and note of each DigiCell. You may double check the connection and installation of the item marked as gray.
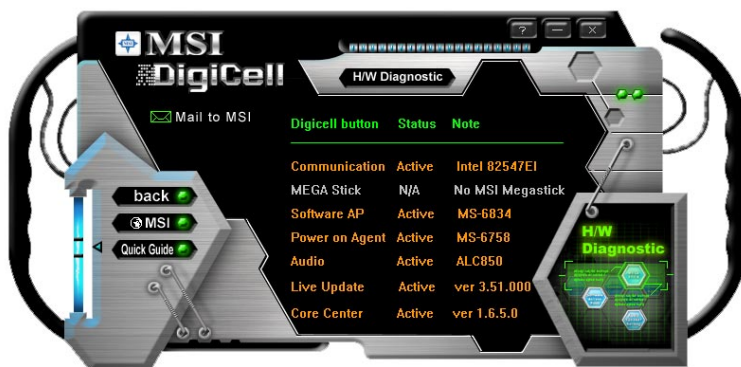
You may also click on the **Mail to MSI** button to send your questions or suggestions to MSI's technical support staff.

Communication

In the **Communication** sub-menu, you can see the status of all the LAN / WLAN / Bluetooth on the screen if the hardware is installed. The first icon indicates the onboard LAN on your system, the second icon indicates the wireless LAN status, and the third one is the information about the bluetooth on your system. Click on each item for details.
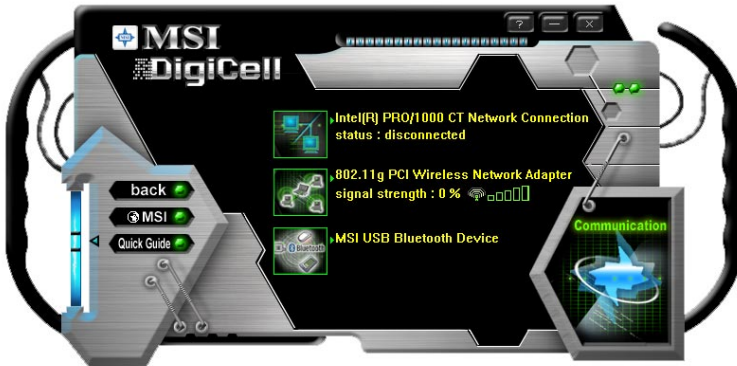
This icon indicates the information and connection status of onboard LAN, which is read-only.

The second icon indicates the wireless connection. You may click this icon to configure the advanced settings in the **WLAN Card Mode** dialogue box (see the image on p.4-8). Please note that it is only available when the **Software Access Point** is set to **WLAN Card Mode**.

The third icon indicates the connection using bluetooth devices. If your system has connected to the bluetooth device, the icon will light up.

Software Access Point

In the **Software Access Point** sub-menu, you can see the communication status on your system and choose the desired software access point mode by clicking on the desired icon. The default settings are configured for your usage. The default software access point mode is set to **WLAN Card Mode**. For more advanced security settings and channels switching, click on **"Setting"** button to enter its sub-menu.

Terminology

Here are the introduction of WLAN / AP communication terminology.

WEP Key

In the wireless network environment, the administrator can set up password (Network Key) to protect the network from being attacked or unauthorized access. When building the network, you can set up 4 sets of WEP keys, which can be 5 characters (10 hexadecimal digital) or 13 characters (26 hexadecimal digital) and specify one of them to use.

Ad-hoc Mode

An Ad-hoc network is a local area network or other small network, especially one with wireless or temporary plug-in connections, in which some of the network devices are part of the network only for the duration of a communications session. Users in the network can share files, print to a shared printer, and access the Internet with a shared modem. In this kind of network, new devices can be quickly added; however, users can only communicate with other wireless LAN computers that are in this wireless LAN workgroup, and are within range.

Infrastructure Mode

The difference between Infrastructure network and Ad-hoc network is that the former one includes an Access Point. In an Infrastructure network, the Access Point can manage the bandwidth to maximize bandwidth utilization. Additionally, the Access Point enables users on a wireless LAN to access an existing wired network, allowing wireless users to take advantage of the wired networks resources, such as Internet, email, file transfer, and printer sharing. The scale and range of the Infrastructure networking are larger and wider than that of the Ad-hoc networking.

Access Point Mode

Click on **"Setting"** button of the **Access Point Mode** and the following screen will display.
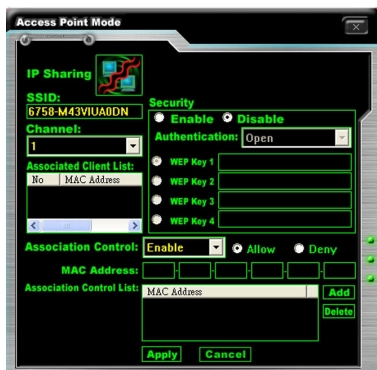
IP Sharing
Click on this icon to enable/disable the IP sharing. The default of this setting is disabled.

 Disabled.   Enabled.

Enabling/disabling IP sharing depends on the different situation. For example:
1. If your family and you are getting on Internet at home with multi computers, and your ISP only provides one IP for you, you may need to enable **IP Sharing** function in order to use this one IP to get on Internet with multi computers simultaneously.
2. If you are getting on Internet in office, usually the LAN card will automatically get the IP this computer uses. In this case you don't have to enable this function.

SSID
Means Service Set Identifier, a *unique* name shared among all points in a wireless network. It must be *identical* for all points in the network. Then the card will be able to connect to an access point with the same SSID.

Channel
Specifies the operating radio frequency channel in **Infrastructure mode**, which should be set to an available one (ex: with less traffic to ensure the stable and better connection).

Associated Client List
This option is to display information of stations that are currently associated to your wireless gateway.

Association Control
This option allows you to control which PC can connect to the wireless LAN. If you

enable this feature, only PCs with MAC address located in Association Control List can connect to the wireless LAN.

MAC Address
MAC stands for Media Access Control. A MAC address is the hardware address of a device connected to a network.

Security
This option allows you to enable/disable the authentication function.

Authentication
Open: Communicates the key across the network.
Shared: Devices must have identical WEP settings to communicate.

WLAN Card Mode

Click on **"Setting"** button of the **WLAN Card Mode** for the WEP status of your APs.

If the AP you are selecting (the highlighted one) is not encrypted (***Disabled*** shown in the **Encryption** column), the screen will display as below. You can click "**Connect**" to make connection to that AP, click "**Cancel**" to close this dialogue box, or click **"Refresh"** button to update the available WLAN connections.
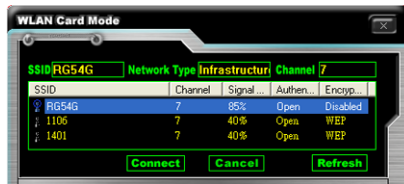
If the network you are selecting is encrypted (***WEP*** shown in the **Encryption** column), the screen will display as below. You need to enter the correct WEP key defined by AP in the specified **WEP Key 1~4** fields to make the connection.
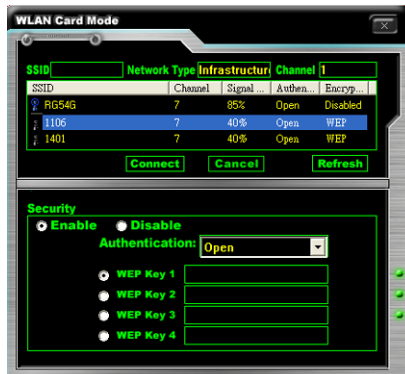
Live Update

Click on the **Live Update** icon in the main menu and the **Live Update** program will be enabled.

The Live Update 3™ is a tool used to detect and update your BIOS/ drivers/VGA BIOS/VGA Driver/OSD/Utility online so that you don't need to search for the correct BIOS/driver version throughout the whole Web site. To use the function, you need to install the "MSI Live Update 3" application. After the installation, the "MSI Live Update 3" icon (as shown on the right) will appear on the screen.
Double click the "MSI Live Update 3" icon, and the following screen will appear:
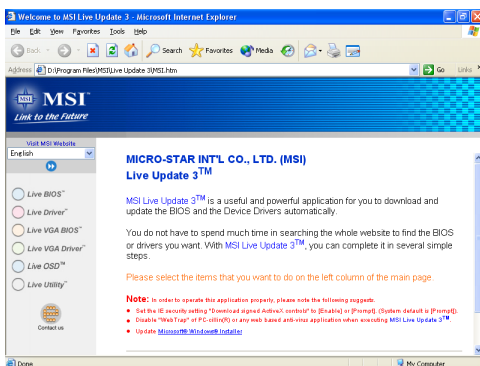
Five buttons are placed on the left column of the screen. Click the desired button to start the update process.

> **Live BIOS** – Updates the BIOS online.
> **Live Driver** – Updates the drivers online.
> **Live VGA BIOS** – Updates the VGA BIOS online.
> **Live VGA Driver** – Updates the VGA driver online.
> **Live OSD** – Updates the firmware of the OSD products online.
> **Live Utility** – Updates the utilities online.

If the product you purchased does not support any of the functions listed above, a "sorry" message is displayed. For more information on the update instructions, insert the companion CD and refer to the "Live Update Guide" under the "Manual" Tab.

MEGA STICK

In the **MEGA STICK** sub-menu, you can configure the settings of MSI MEGA STICK and the media files (*.m3u, *.mp3, *.wav, *.cda, *.wma) on your system.

Basic Function

Here you can edit your own play list with the buttons **"load", "save", "delete", "shuttle", "repeat"** & **"print".**

Load	To load media files or the playlist of mp3 files (*.m3u) on your system or on your MEGA STICK.
Save	To save a loaded playlist of mp3 files (*.m3u) on your system or on your MEGA STICK.
Delete	Click on the media files in the **Play List:** field and use **"Delete"** button to remove the media file from the play list. You may remove multi media files simultaneously by using "Ctrl" to select multi files.
Shuffle	To play the media file in the **Play List:** in a random order.
Repeat	To repeat the selected files in the **Play List:**.
Print	This button has 2 functions:

    1. To print out the details of current play list through your printer with the following information:

       Song title --- Song length --- Singer name

    2. To save the details of current play list and save the file in the plain text file format in the *Program files\MSI\DigiCell\MyMusic.txt* for your reference. The *MyMusic.txt* file is with the following information:

       Song title --- Song length --- Singer name

There is also a toolbar for you to execute some basic function, like play, stop, pause, previous/next song, song info and volume adjust. There is also a scroll bar on the top for you to forward/rewind**.**
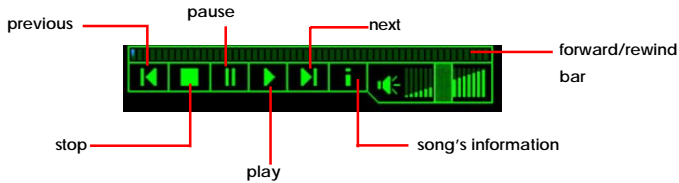
Right-click on the MP3 file and choose **"Info"**, a **MP3 Info** dialogue will pop up to show the information of the file, including the title, artist, album, release year and others. You may also add your own comment in the **comment** field. Then click **"Save"** to save the change, click **"Cancel"** to discard the change, or click **"Remove"** to all this information.

Non-Unicode programs supported

If you are using an operating system in European languages, and you'd like to play the media files in MEGA STICK with East-Asian languages (such as Chinese, Japanese... etc.), it is possible that the file names will display incorrectly.

You can install the *Supplemental Language Support* provided by Microsoft to solve this problem. You need to have your Microsoft Setup CD prepared in the CD-ROM. The system will start to install the necessary components after the settings are configured here. Follow the steps described below.

    1. Go to [Control Panel] and choose [Regional and Languages Options].
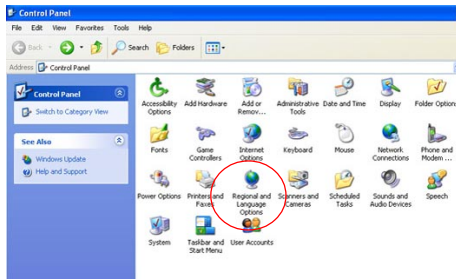
    2. Go to the [Languages] tab and enable the check box of [Install files for East Asian languages]. A dialogue box will pop up to remind you the above selection is chosen.
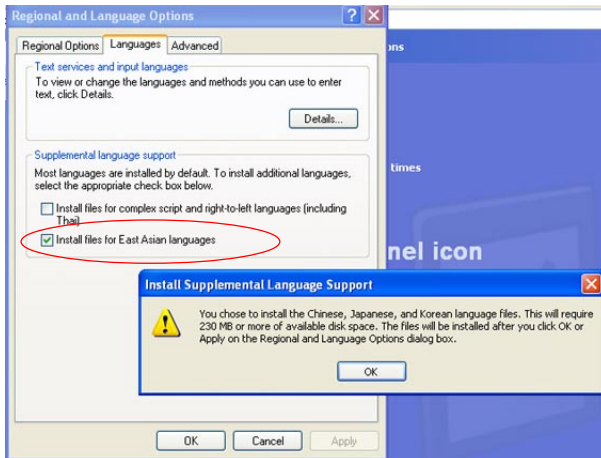
3. Then go to the [Advanced] tab and select ***the language you want to be
supported*** (the language of the filename in the MegaStick) from the drop-
down list in the [Language for non-Unicode programs], then click [Apply]. The
system will install the necessary components from your Microsoft Setup CD
immediately.
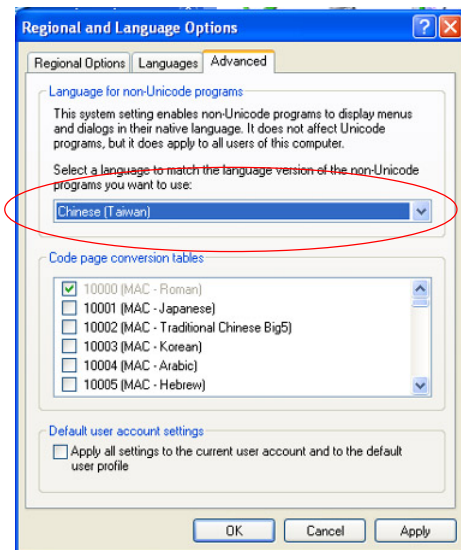
Core Center (for Pentium 4 CPU)

Click on the **Core Center** icon in the main menu and the **Core Center** program will be enabled.

CoreCenter is just like your PC doctor that can detect, view and adjust the PC hardware and system status during real time operation.
In the left side it shows the current system status including the Vcore, 3.3V, +5V and 12V. In the right side it shows the current PC hardware status such as the CPU & system temperatures and all fans speeds.

When you click the red triangles in the left and right sides, two sub-menus will open for users to adjust the thresholds of system to send out the warning messages.

Left-wing: Current system status

In the left sub-menu, you can configure the settings of FSB, Vcore, Memory Voltage and AGP Voltage by clicking the radio button next to each item and make it available (the radio button will be lighted as yellow when selected), use the "**+**" and "**-**" buttons to adjust, then click **"OK"** to apply the changes. Then you can click **"Save"** to save the values you just configured.

Also you may click **"Auto"** to start testing the maximum CPU overclocking value. The CPU FSB will automatically increase the testing value until the PC reboots. Or you may click **"Default"** to restore the default values.

Right-wing: PC hardware status during real time operation

In the right sub-menu, here you can configure the PC hardware status such as CPU & system temperatures and fan speeds. You may use the scroll bars to adjust each item, then click **"OK"** to apply the changes. The values you set for the temperatures are the maximum thresholds for the system for warnings, and the value for fan speeds are the minimum thresholds.

Audio Speaker Setting

In the **Audio Speaker Setting** sub-menu, you can configure the multi-channel audio operation, perform speaker test, and choose the environment you prefer while enjoying the music.

You can scroll the bar of each equalizer to regulate for current playing digital sound source. Also you may click on the **"on"** button to enable/disable the equalizer function. Once the equalizer function is enabled, you can choose several preset equalizers for your preference. You may also right-click anywhere to execute this function. After you have chosen one equalizer, it will be indicated next to the "**on**" button in yellow.
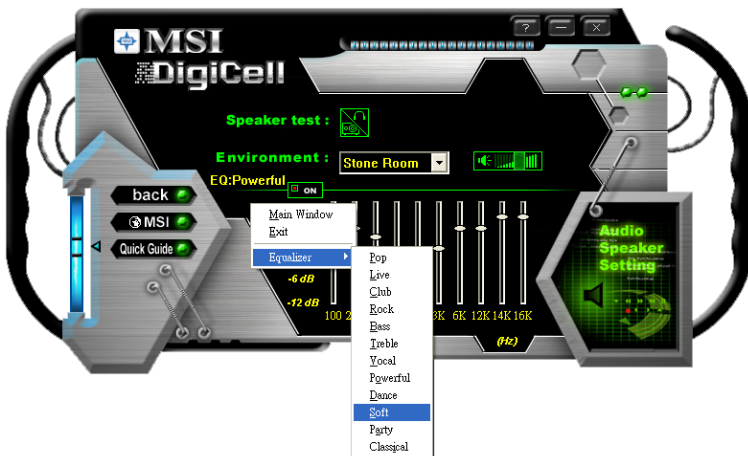
The **Environment** setting lets you select the environment you like, such as *Cave* or *Convert Hall*.

Click on the **"Speaker test"** button and the following dialogue box will appear:
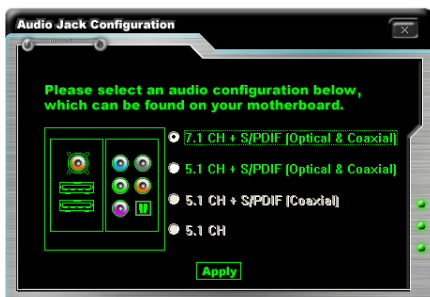
In this **Speaker Configuration** dialogue box, select the audio configuration which is identical to the audio jack on your mainboard. Once the correct audio configuration is selected, click **"Apply"** to save the changes. Then the following screen will appear. In this **Speaker Configuration** dialogue box, first select the correct item from the **Speaker mode** drop-down list, and then click on each connected speaker to ensure if Headphone, 2-, 4-, 5.1-, or 7.1- channel audio operation is working properly. If any speaker fails to make sound, then check whether the cable is inserted firmly to the connector, or replace the bad speakers with good ones.
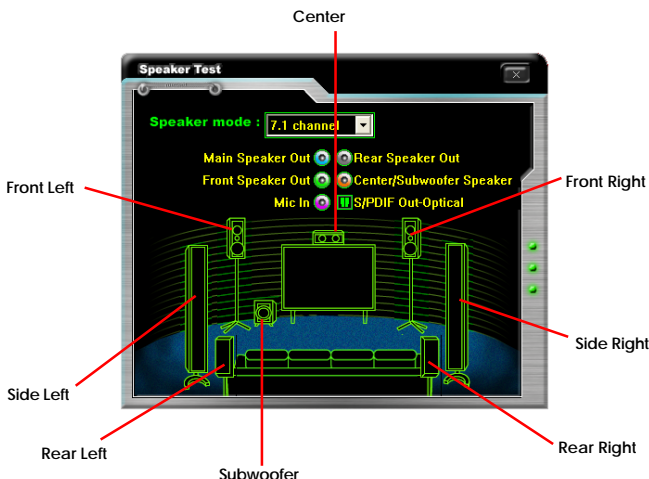
MSI Reminds You...
*For the advanced functions of the audio codec, please refer to **Chapter 7: Introduction to CMI 9880L Audio Codec** for details.*

Power on Agent

In the **Power on Agent** sub-menu, you can configure setting of power-on, power-off and restarting status.

In the screen below, you can set the date, time, start-up programs respectively for power-on, power-off and restarting.
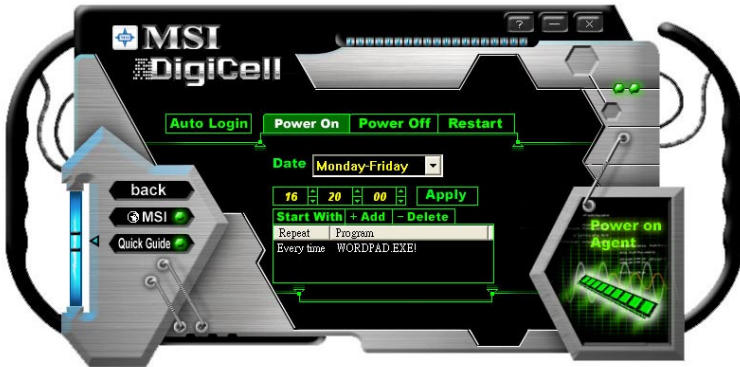
Power On

Here are the available settings for **Power On** function:

Date   Use the drop-down list to select the date for power-on.

Time   Use the arrow keys to select the hour/minute/second for power-on, power-off and restarting. Then click **"Apply"** to save the changes. As you click **"Apply"**, the following dialogue will appear to show you the next power-on schedule, and the system will start to count down to restart. Click **"OK"** to restart the computer right away or click **"Later"** to restart your computer later.
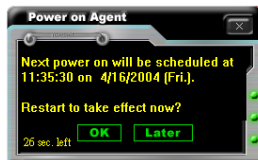
> **MSI Reminds You...**
> *Please note that the new setting will not take effect until you restart your computer.*

Power Off / Restart

You may configure the time (in the format hh:mm:ss) for the next power-off / restart.

Start With

Use the button **"+Add"** to add the start-up programs as DigiCell is activated next time. For example, you may like to have Outlook activated or a specified website linked when you get to the office every morning.

add the desired start-
with program

Step 1: Click on the **Program:** field and click **">>"** button to browse for the path of Outlook or Internet Explorer.

Step 2: Click on **"OK"** to apply the setting.

Step 3: For specified file or specified website, you may enter the file name with the complete path or the website link in the **Parameters:** field.
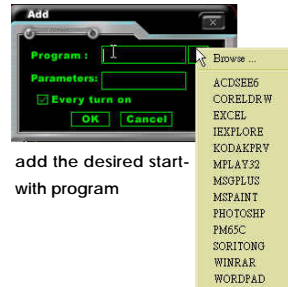
To activate Outlook as DigiCell
is enabled next time
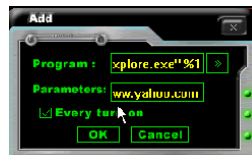
To activate a specified website
as DigiCell is enabled next time

Of course you may use the button **"-Delete"** to remove the added programs, or you can right-click on the selected program and click **Delete**.

delete the added program

MSI Reminds You...
*You can also enable the **Every turn on** function, which will enable the specified program(s) and file(s) every time the Digi Cell utility runs.*

Auto Login
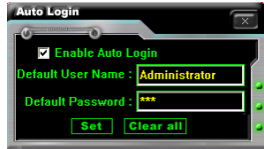
Since the **Power On** function allows the system to power on automatically, you may have to enable this **Auto Login** function in the following situations:
1. If you are using a computer belonging to a domain in office, and you need to enter your user name & password everytime when you boot up your computer.
2. If there are multi users using the same computer and you'd like to power on the computer automatically with one specific user.

Enable Auto Login
Enable this setting if you want to use the **Auto Login** feature. It supports the following operating systems: Win9X, Windows ME, Windows 2000 & Windows XP.

Default User Name
It is only available for Windows 2000 & Windows XP.
    -- If you are using a computer belonging to a domain in office, please enter your login user name in this field.
    -- If you are using a computer with multi users (for Windows XP operating system), please enter the user name you'd like to auto power-on in this field.

Default Password
It is only available for Windows 2000 & Windows XP.
    -- If you are using a computer belonging to a domain in office, please enter your login password in this field.
    -- If you are using a computer with multi-users (for Windows XP operating system), please enter the password for the user name you'd like to auto power-on in this field.

Introduction to Intel ICH6R SATA RAID

The southbridge ICH6R provides a hybrid solution that combines two independent SATA ports for support of up to two Serial ATA (Serial ATA RAID) drives.

Serial ATA (SATA) is the latest generation of the ATA interface. SATA hard drives deliver blistering transfer speeds up to 150MB/sec. Serial ATA uses long, thin cables, making it easier to connect your drive and improving the airflow inside your PC. The most outstanding features are:

1. Supports 150 MB/s transfers with CRC error checking.
2. Supports Hot-plug-n-play feature.
3. Data handling optimizations including tagged command queuing, elevator seek and packet chain command.

Intel ICH6R includes the RAID level 0 (striping), RAID level 1 (mirroring), and a combination of the two called Intel Matrix RAID Technology, which has two volume in a single RAID array.

RAID 0 breaks the data into blocks which are written to separate hard drives. Spreading the hard drive I/O load across independent channels greatly improves I/O performance. RAID 1 provides data redundancy by mirroring data between the hard drives and provides enhanced read performance.

MSI Reminds You...
All the information/volumes listed in your system might differ from the illustrations in this appendix.

BIOS Configuration

The Intel RAID Option ROM should be integrated with the system BIOS on all motherboards with a supported Intel chipset. The Intel RAID Option ROM is the Intel RAID implementation and provides BIOS and DOS disk services. Please use <Ctrl> + <I> keys to enter the "Intel(R) RAID for Serial ATA" status screen, which should appear early in system boot-up, during the POST (Power-On Self Test). Also, you need to enable the RAID function in BIOS (please to P.3-13 items ***ATA/IDE Configuration <Enhanced>*** & ***Configure SATA as <RAID>*** for details) to create, delete and reset RAID volumes.

Using the Intel RAID Option ROM

1. Creating, Deleting and Resetting RAID Volumes:

The Serial ATA RAID volume may be configured using the RAID Configuration utility stored within the Intel RAID Option ROM. During the Power-On Self Test (POST), the following message will appear for a few seconds:

MSI

MSI Reminds You...
The "Driver Model", "Serial #" and "Size" in the following example might be different from your system.

```
Intel(R) Application Accelerator RAID Option ROM v4.0.0.6211
Copyright(C) 2003-04 Intel Corporation.  All Rights Reserved.

  RAID Volumes:
  ID   Name             Level          Strip  Size      Status      Bootable
  0    RAID_Volume0     RAID0(Stripe)  128KB  68.9GB    Normal      Yes

  Physical Disks:
  Port Drive Model      Serial #              Size      Type/Status(Vol ID)
  0    WDC WD360GD-00FN WD-WMAH91041833       34.4GB    Member Disk(0)
  1    WDC WD360GD-00FN WD-WMAH91041807       34.4GB    Member Disk(0)
  2    HDS722580VLSA80  VNRB3EC2D549SL        76.6GB    Non-RAID Disk
  3    HDS722580VLSA80  VNRB3EC2D542XL        76.6GB    Non-RAID Disk

Press <CTRL-I> to enter Configuration Utility..
```

After the above message shows, press <Ctrl> and <I> keys simultaneously to enter the RAID Configuration Utility.

MSI

MSI Reminds You...
The following procedure is only available with a newly-built system or if you are reinstalling your OS. It should not be used to migrate an existing system to RAID 0 or RAID 1.

2. Creating, Deleting and Resetting RAID Volumes:

After pressing the <Ctrl> and <I> keys simultaneously, the following window will appear:

```
Intel(R) Application Accelerator RAID Option ROM v4.0.0.6211
Copyright(C) 2003-04 Intel Corporation.  All Rights Reserved.
======================[ MAIN MENU ]======================
                  1.  Create RAID Volume
                  2.  Delete RAID Volume
                  3.  Reset Disks to Non-RAID
                  4.  Exit

==============[ DISK/VOLUME INFORMATION ]==============
RAID Volumes:
None defined.

Physical Disks:
Port Drive Model     Serial #        Size    Type/Status(Vol ID)
0    WDC WD360GD-00FN WD-WMAH91041033 34.4GB  Non-RAID Disk
1    WDC WD360GD-00FN WD-WMAH91041007 34.4GB  Non-RAID Disk
2    HDS722580VLSA80  VNRB3EC2D549SL  76.6GB  Non-RAID Disk
3    HDS722580VLSA80  VNRB3EC2D542XL  76.6GB  Non-RAID Disk



      [↑↓]-Select      [ESC]-Exit      [ENTER]-Select Menu
```

(1) Create RAID Volume

1. Select option 1 "Create RAID Volume" and press <Enter> key. The following screen appears. Then in the **Name** field, specify a RAID Volume name and then press the <TAB> or <Enter> key to go to the next field.
2. Use the arrow keys to select the RAID level (RAID0 or RAID1) best suited to your usage model in **RAID Level**.

```
Intel(R) Application Accelerator RAID Option ROM v4.0.0.6211
Copyright(C) 2003-04 Intel Corporation.  All Rights Reserved.
==================[ CREATE VOLUME MENU ]==================
              Name:  RAID_Volume0
        RAID Level:  RAID0(Stripe)
             Disks:  Select Disks
        Strip Size:  128KB
          Capacity:  0.0   GB

                     Create Volume

=========================[ HELP ]=========================
        Choose the RAID level best suited to your usage model.

  RAID0(Stripe) - Creates a volume where equal portions of the volume
                  are spread across all the disks.  This creates a volume
                  with higher performance by accessing all disks at once.

  RAID1(Mirror) - Creates a volume where a redundant copy of the data is
                  stored on each disk.  This creates a volume protected
                  from a single hard disk failure.

      [↑↓]Change   [TAB]-Next  [ESC]-Previous Menu  [ENTER]-Select
```

3. In the **Disk** field, press <Enter> key and the following screen appears. Use <Space> key to select the disks you want to create for the RAID volume, then click <Enter> key to finish selection.
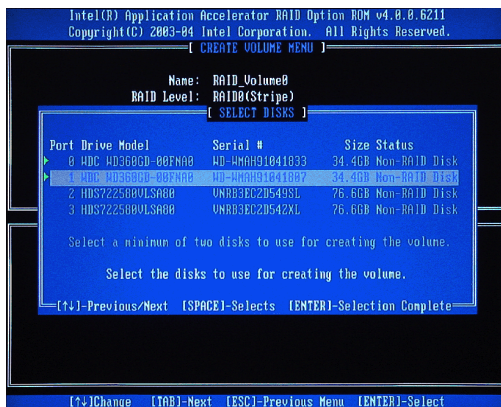
4. Then select the strip value for the RAID 0 or RAID 1 array by using the "upper arrow" or "down arrow" keys to scroll through the available values, and pressing the <Enter> key to select and advance to the next field. The available values range from 4KB to 128 KB in power of 2 increments. The strip value should be chosen based on the planned drive usage. Here are some suggested selections:
    16 KB – Best for sequential transfers
    64 KB – Good general purpose strip size
    128 KB – Best performance for most desktops and workstations. The default value.
5. Then select the capacity of the volume in the **Capacity** field. The default value is the maximum volume capacity of the selected disks.
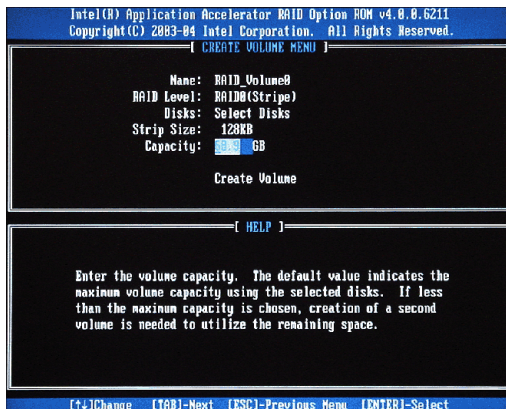
6. Then the following screen appears for you to confirm if you are sure to create the RAID volume. Press <Y> to continue.
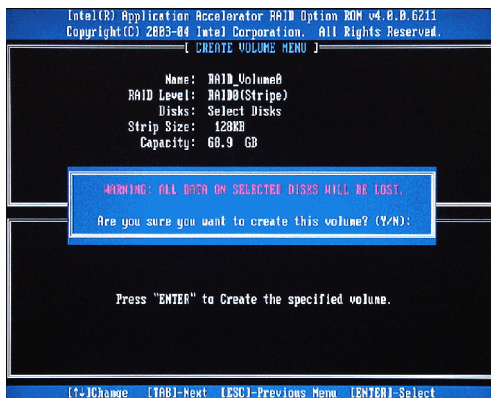
7. Then the following screen appears to indicate that the creation is finished.

(2) Delete RAID Volume

Here you can delete the RAID volume, but please be noted that all data on RAID drives will be lost.

MSI Reminds You...
If your system currently boots to RAID and you delete the RAID volume in the Intel RAID Option ROM, your system will become unbootable.

Select option 2 **Delete RAID Volume** from the main menu window and press <Enter> key to select a RAID volume for deletion. Then press <Delete> key to delete the selected RAID volume. The following screen appears.
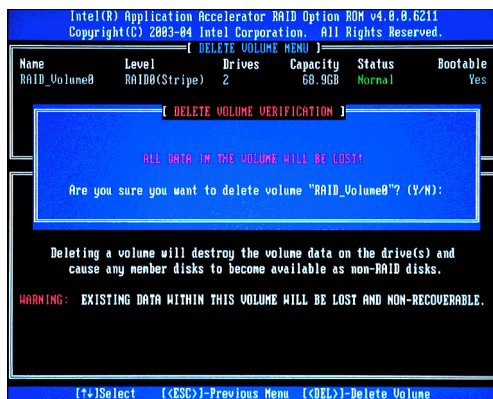
Press <Y> key to accept the volume deletion.

(3) Reset Disks to Non-RAID

Select option 3 **Reset Disks to Non-RAID** and press <Enter> to delete the RAID volume and remove any RAID structures from the drives. The following screen appears:
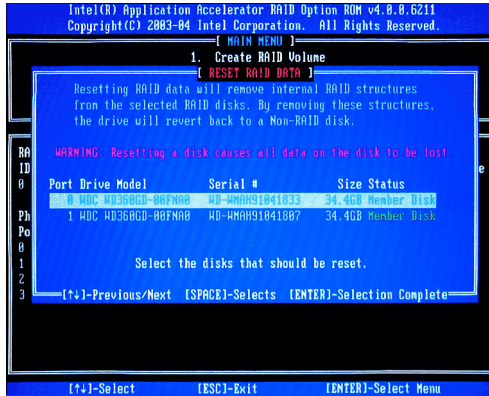
Press <Y> key to accept the selection.

MSI Reminds You...
1. *You will lose all data on the RAID drives and any internal RAID structures when you perform this operation.*
2. *Possible reasons to 'Reset Disks to Non-RAID' could include issues such as incompatible RAID configurations or a failed volume or failed disk.*

Installing Software

Install Driver in Windows XP / 2000

➤ **New Windows XP / 2000 Installation**
The following details the installation of the drivers while installing Windows XP / 2000.
   1. Start the installation:
      Boot from the CD-ROM. Press F6 when the message "Press F6 if you need to install third party SCSI or RAID driver" appears.
   2. When the Windows XP Setup window is generated, press S to specify an Additional Device(s).
   3. Insert the driver diskette *Intel IAA RAID XP Driver For ICH6R (FW82801FR)* into drive A: and press <Enter>.
   4. Choose the driver *Intel(R) 82801FR SATA RAID Controller* from the drop-down list that appears on Windows XP Setup screen, and press the <Enter> key.
   5. Press <Enter> to continue with installation or if you need to specify any additional devices to be installed, do so at this time. Once all devices are specified, press <Enter> to continue with installation.
   6. From the Windows XP/2000 Setup screen, press the <Enter> key. Setup will now load all device files and then continue the Windows XP/2000 installation.

➤ **Existing Windows XP/2000 Driver Installation**
   1. Insert the MSI CD into the CD-ROM drive.
   2. The CD will auto-run and the setup screen will appear.
   3. Under the Driver tab, click on *Intel IAA RAID Edition*.
   4. The drivers will be automatically installed.

➤ **Confirming Windows XP/2000 Driver Installation**
   1. From Windows XP/2000, open the **Control Panel** from **My Computer** followed by the System icon.
   2. Choose the **Hardware** tab, then click the **Device Manager** tab.
   3. Click the "**+**" in front of the **SCSI and RAID Controllers** hardware type. The driver *Intel(R) 82801FR SATA RAID Controller* should appear.

Installation of Intel Application Accelerator RAID Edition

The Intel Application Accelerator RAID Edition driver may be used to operate the hard drive from which the system is booting or a hard drive that contains important data. For this reason, you cannot remove or un-install this driver from the system after installation; however, you will have the ability to un-install all other non-driver components.

Insert the MSI CD and click on the **Intel IAA RAID Edition** to install the software.
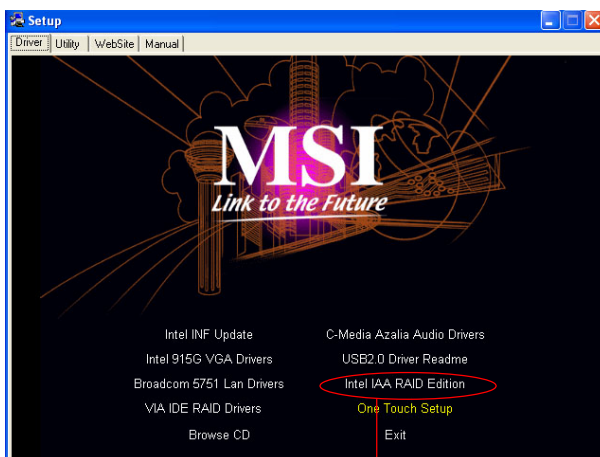
Click on this item

The **InstallShield Wizard** will begin automatically for installation showed as following:

Click on the **Next** button to proceed the installation in the welcoming window.
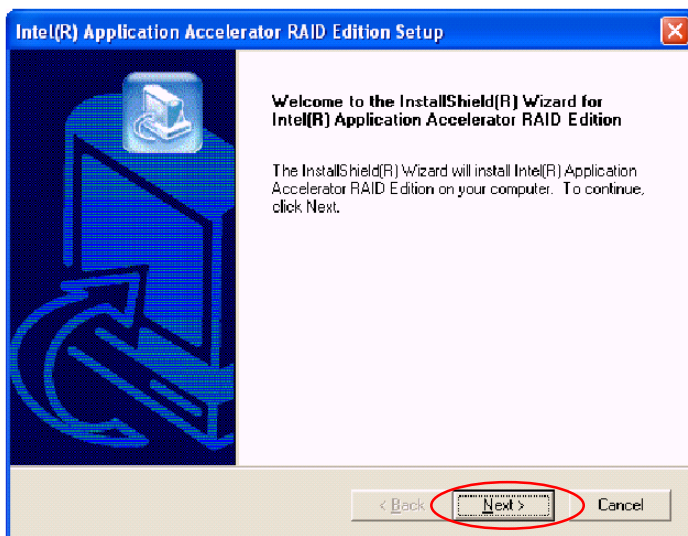
The window shows the components to be installed. Click **Next** button to continue.
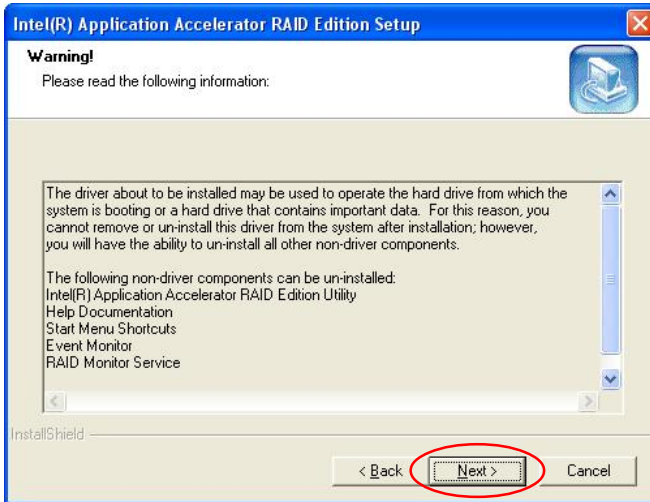
After reading the license agreement in the following window, click **Yes** button to continue.
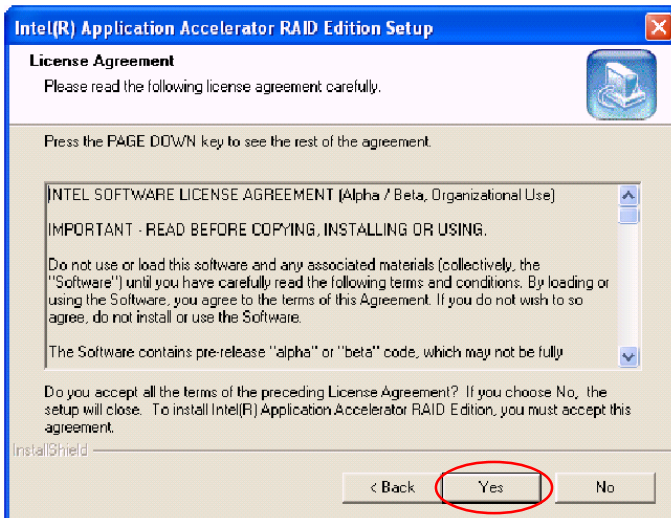
Select the folder in which you want the program to be installed in the following window, and click **Next** button to start installation.
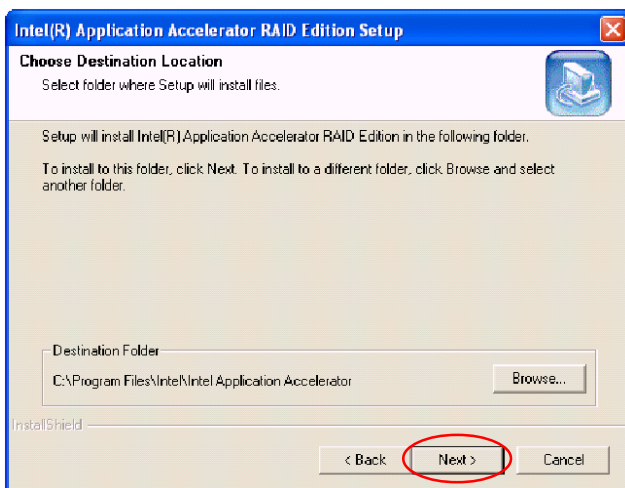
Select a program folder in the following window where you want Setup to add the program icon.
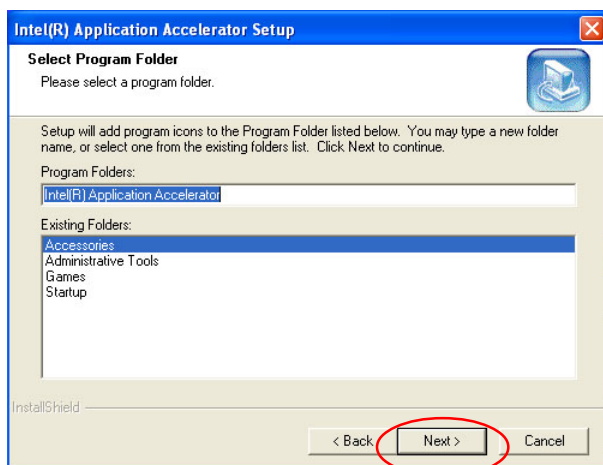
The following window appears to show the Intel Application Accelerator RAID Edition Setup installation status.
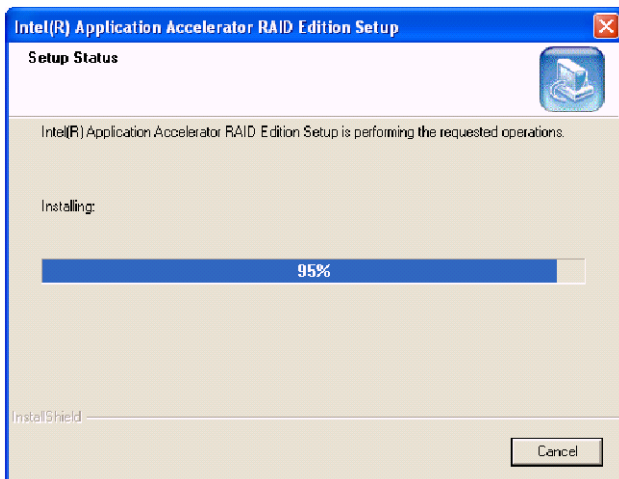
Once the installation is complete, the following window appears.
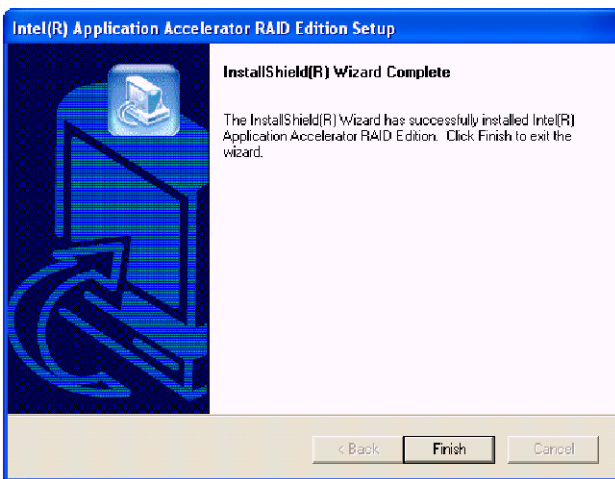
RAID Migration Instructions

The Intel Application Accelerator RAID Edition offers the flexibility to upgrade from a single Serial ATA (SATA) hard drive to a two drive RAID 0 or RAID 1 configuration when an additional SATA hard drive is added to the system. This process will create a new RAID volume from an existing disk. However, several important steps must be followed at the time the system is first configured in order to take advantage of RAID when upgrading to a second SATA hard drive:

1. BIOS must be configured for RAID before installing Windows* XP on the single SATA hard drive. Refer to P.3-13 **BIOS Configuration** for properly setting of the BIOS.
2. Install the Intel Application Accelerator RAID Driver during Windows Setup. Refer to P.5-8 **Installing Software** for instructions on installing the driver during Windows Setup.
3. Install the Intel Application Accelerator RAID Edition after the operating system is installed.

To create a volume from an existing disk, complete the following steps:

MSI Reminds You...
*A **Create from Existing Disk** operation will delete all existing data from the added disk and the data cannot be recovered. It is critical to backup all important data on the added disk before proceeding. However, during the migration process, the data on the source disk is preserved.*

After the Intel Application Accelerator RAID Edition has been successfully installed and the system has rebooted, click on the Intel Application Accelerator shortcut link (**Start --> All Programs --> Intel(R) Application Accelerator --> Intel Application Accelerator**) and the following window will appear:
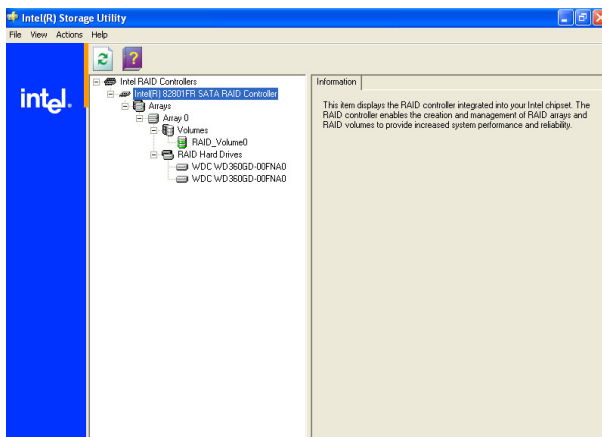
Create RAID Volume from Existing Disk

To create a RAID volume from an existing disk, choose **Action --> Create RAID Volume from Existing Hard Drive**.
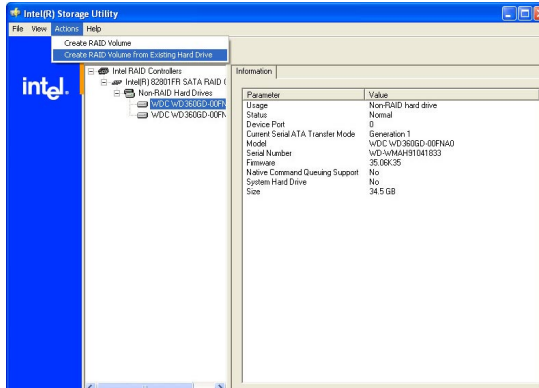
The **Create RAID Volume from Existing Hard Drive Wizard** pops up to lead you for the following procedure. Click **Next** to continue.
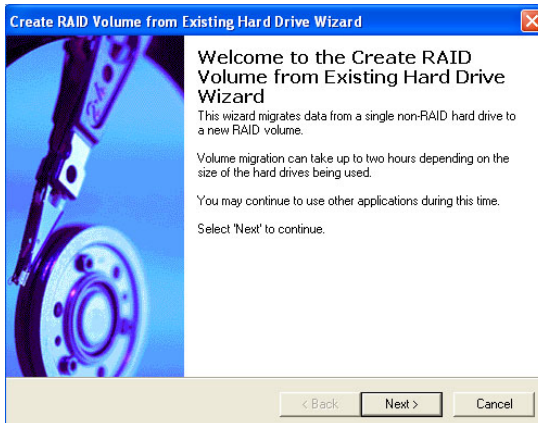
(1) Step 1: Configure Volume

Here you can configure the new RAID volume by entering the volume name, selecting the RAID level and strip size.
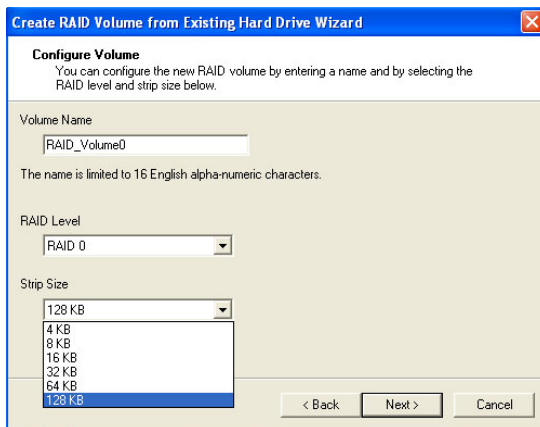
➤ **RAID Volume Name:**
A desired RAID volume name needs to be typed in where the 'RAID_Volume0' text currently appears above. The RAID volume name has a maximum limit of 16 characters. The RAID volume name must also be in English alphanumeric ASCII characters.

➤ **RAID Level:**
Select the desired RAID level:

RAID 0 (Performance) – A volume optimized for performance will allow you to access your data more quickly.

RAID 1 (Redundancy) – A volume optimized for data redundancy will provide you with a realtime duplicate copy of your data. Note: Only half of the available volume space will be available for data storage.

➤ **Strip Sizes:**
Select the desired strip size setting. As indicated, the optimal setting is 128KB. Selecting any other option may result in performance degradation. Even though 128KB is the recommended setting for most users, you should choose the strip size value which is best suited to your specific RAID usage model. The most typical strip size settings are:

4KB: For specialized usage models requiring 4KB strips
8KB: For specialized usage models requiring 8KB strips
16KB: Best for sequential transfers
32KB: Good for sequential transfers
64KB: Good general purpose strip size
128KB: Best performance for most desktops and workstations

(2) Select the source disk

Then select the source disk that you wish to use and then click **"--->"** to move it to the **Selected** field. Then click **Next** to continue.

It is very important to note which disk is the source disk (the one containing all of the information to be migrated) and which one is the target disk. On a RAID Ready system, this can be determined by making a note during POST of which port (e.g. Port 0 or Port 1) the single disk is attached to.

You can also use the Intel Application Accelerator RAID Edition utility before the second disk is installed to verify the Port and serial number of the drive that contains all the data.
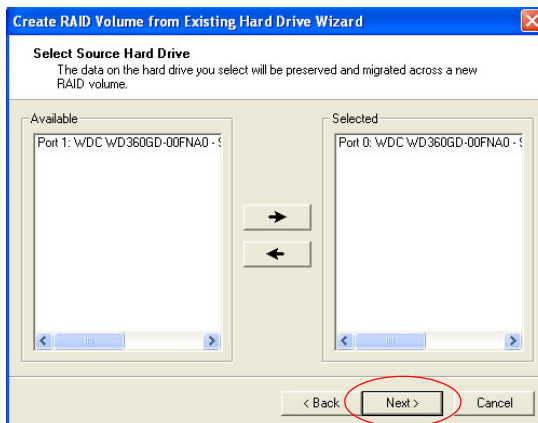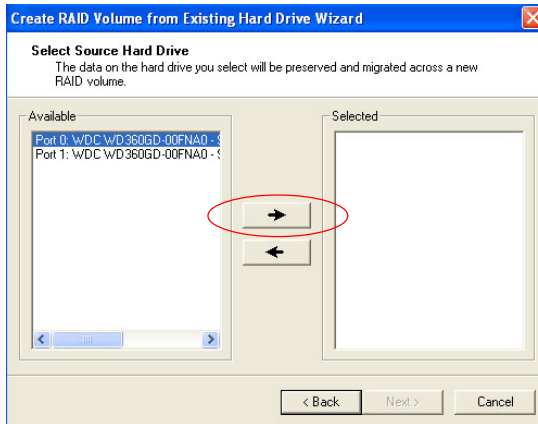
(3) Select Member Hard Drive(s)
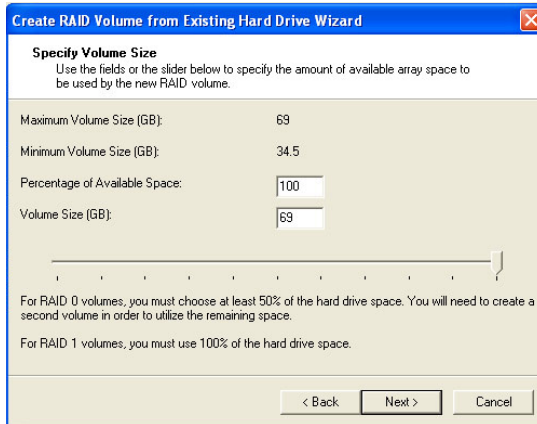
Then select the member disk (the target disk) that you wish to use and then click **"--->"** to move it to the **Selected** field. Then click **Next** to continue.

Please note that the existing data on the selected hard drive(s) will be deleted permanently. Do not forget to back up all the important data before continuing.
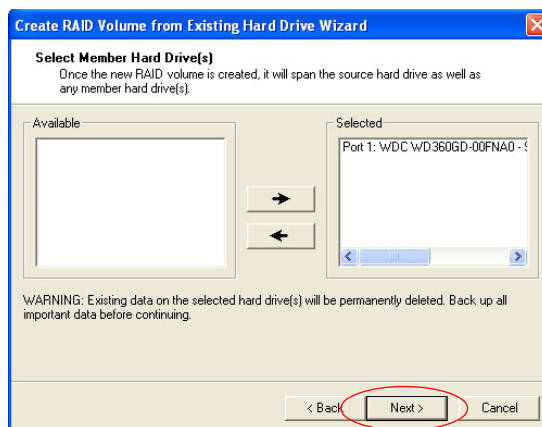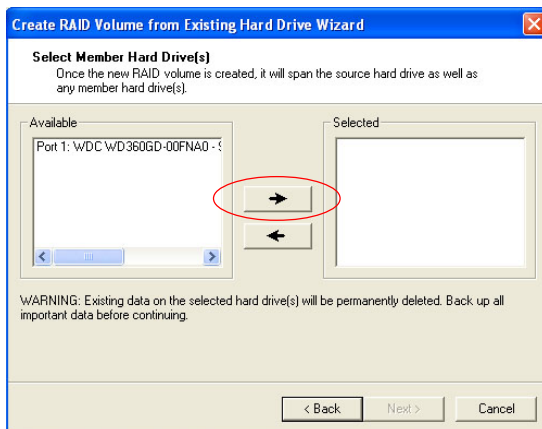
(4) Specify Volume Size
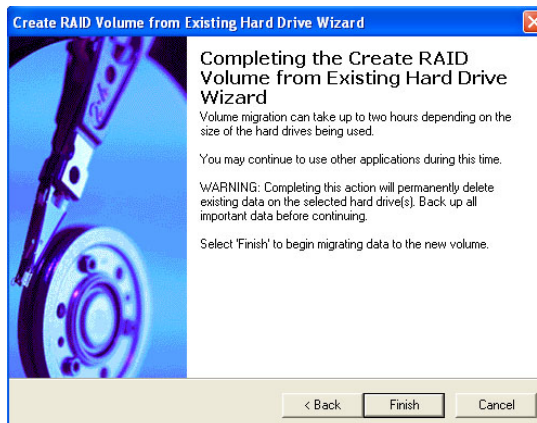
Specify the amount of available array space to be used by the new RAID volume. You may enter the amount in the space or use the slider to specify. It is recommended you use 100% of the available space for the optimized usage, either for RAID 0 or RAID1 volume. For RAID 0 volume, if you do not specify 100% of the hard drive space, the rest hard drive space will be worked as RAID 1 volume, which is the new technology called Intel Matrix RAID. Then click **Next** to continue.

(5) Start Creating RAID Volume from Existing Hard Drive Wizard

Before you continue the procedure of RAID volume creation from existing hard drive, read the dialogue box below carefully. Please note that once you click **Finish**, the existing data on the selected hard drive(s) will be deleted permanently and this operation cannot be undone. It is critical that you backup all important data before selecting **Finish** to start the migration process.

(6) Start Migration

The migration process may take up to two hours to complete depending on the size of the disks being used and the strip size selected. A dialogue window will appear stating that the migration process may take considerable time to complete, meanwhile a popup dialogue at the taskbar will also show the migration status. While you can still continue using your computer during the migration process, once the migration process starts, it cannot be stopped. If the migration process gets interrupted and your system is rebooted for any reason, it will pick up the migration process where it left off. You will be provided with an estimated completion time (the remaining time will depend on your system) once the migration process starts.
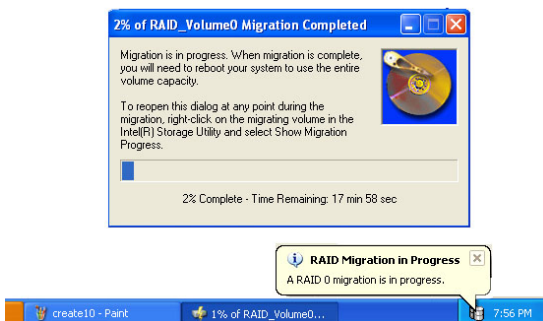
The following screen appears if the migration process is completed successfully. Then you have to reboot your system to use the full capacity of the new volume.
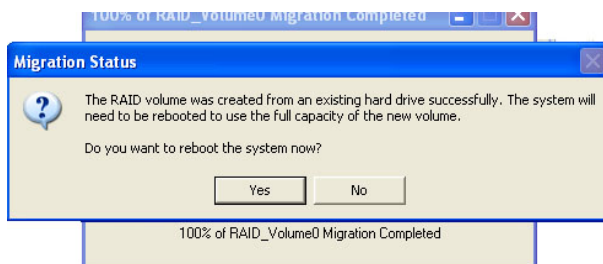
Introduction to VIA VT6410 IDE RAID

The VIA IDE RAID solution uses the VT6410 chip (a two-channel ATA 133 solution) as a RAID controller. The RAID software is a Windows-based software utility. Its graphical user interface provides an easy way to configure and manage disk drives or disk arrays connected to the VT6410 controller. Listed below are the main features and benefits of VIA IDE RAID:

1. Supports ATA 133 high performance hard disk drive.
2. Supports hard disk drive larger than 137 GB (48-bits LBA).
3. Dual independent ATA channels and maximum connection of four hard disk drives allowed.
4. Supports Ultra DMA mode 6/5/4/3/2/1/0, DMA mode 2/1/0, and PIO mode 4/3/2/1/0.
5. Supports PCI Plug and Play. PCI interrupt sharing and coexists with mainboard IDE controller.
6. Supports IDE bus master operation.
7. Supports RAID 0, 1, 0+1, and JBOD.
8. 4 KB to 64 KB striping block size support.
9. Bootable disk or disk array support.
10. Windows-based RAID configuration and management software tool. (Compatible with BIOS)
11. Real-time monitoring of device status and error alarm with popup message box and beeping.
12. Supports hot-swap failed disk drive in RAID 1 and 0+1 array.
13. Mirroring automatic background rebuilds support.
14. ATA SMART function support.
15. Event log for easy troubleshooting.
16. On-line help for easy operation for RAID software.

Introduction

This section gives a brief introduction on the RAID-related background knowledge and a brief introduction on VIA IDE RAID Host Controller. For users wishing to install their VIA IDE RAID driver and RAID software, proceed to **Installing Software** section.

RAID Basics

RAID (Redundant Array of Independent Disks) is a method of combining two or more hard disk drives into one logical unit. The advantage of an Array is to provide better performance or data fault tolerance. Fault tolerance is achieved through data redundant operation, where if one drives fails, a mirrored copy of the data can be found on another drive. This can prevent data loss if the operating system fails or hangs. The individual disk drives in an array are called "members". The configuration information of each member is recorded in the "reserved sector" that identifies the drive as a member. All disk members in a formed disk array are recognized as a single physical drive to the operating system.

Hard disk drives can be combined together through a few different methods. The different methods are referred to as different RAID levels. Different RAID levels represent different performance levels, security levels and implementation costs. The RAID levels which the VIA VT6410 SATA RAID Host Controller supports are RAID 0, RAID 1, RAID 0+1 & JBOD. The table below briefly introduce these RAID levels.

RAID Level	No. of Drives	Capacity	Benefits
RAID 0 (Striping)	2	Number drives * Smallest size	Highest performance without data protection
RAID 1 (Mirroring)	2	Smallest size	Data protection
RAID 0+1 (Striping/Mirroring)	4	2* smallest size	Highest performance with data protection
JBOD (Spanning)	2	Sum of all drives	No data protection and performance improvement, but disk capacity is fully used.

RAID 0 (Striping)

RAID 0 reads and writes sectors of data interleaved between multiple drives. If any disk member fails, it affects the entire array. The disk array data capacity is equal to the number of drive members times the capacity of the smallest member. The striping block size can be set from 4KB to 64KB. RAID 0 does not support fault tolerance.

RAID 1 (Mirroring)

RAID 1 writes duplicate data onto a pair of drives and reads both sets of data in parallel. If one of the mirrored drives suffers a mechanical failure or does not respond, the remaining drive will continue to function. Due to redundancy, the drive capacity of the array is the capacity of the smallest drive. Under a RAID 1 setup, an extra drive called the "spare drive". can be attached. Such a drive will be activated to replace a failed drive that is part of a mirrored array. Due to the fault tolerance, if any RAID 1 drive fails, data access will not be affected as long as there are other working drives in the array.

RAID 0+1 (Striping/Mirroring)

RAID 0+1 is a combination of RAID 0 and RAID 1 array types. A minimum of four drives needs to be installed. With a four-drive array, there must be two pairs of RAID 0 drives. Each pair mirrors the data on the other pair of striping drives. The data capacity is two times the smallest drive. In a four-drive array, a single drive failure will cause the whole array to become, in essence, a RAID Level 0 array. However, this does not impact the data access. Another unique feature of RAID 0+1 is dual fault tolerance. In some cases, two drives can fail simultaneously and still maintain the integrity of the data. The data can still be accessed and worked like a RAID 0 array. Assume the drives are configured as follows (M = Master, S = Slave, A/B indicates which striping pair the drive belongs to, number indicates which part of stripe data):

	IDE 2	IDE 3
M	Drive A1	Drive A2
S	Drive B1	Drive B2

In a RAID 0+1 array, the data integrity will remain if any 1, 2 combination survives. The following table indicates the possible combination of dual drive failure and the respective results of each case.

Failed Drives	Array Status	Note
A1, A2	Working	B1, B2 retains array integrity
B1, B2	Working	A1, A2 retains array integrity
A1, B2	Working	B1, A2 retains array integrity
B1, A2	Working	A1, B2 retains array integrity
A1, B1	Failure	A2, B2 contains only half of array data
A2, B2	Failure	A1, B1 contains only half of array data

JBOD (Spanning)

A spanning disk array is equal to the sum of the all drives when the drives used are having different capacities. Spanning stores data onto a drive until it is full, then proceeds to store files onto the next drive in the array. When any disk member fails, the failure affects the entire array. JBOD is not really a RAID and does not support fault tolerance.

BIOS Configuration

When the system powers on during the POST (Power-On Self Test) process, press <Tab> key to enter the BIOS configuration.

The VIA IDE RAID volume may be configured using the VIA Tech. RAID BIOS. Always use the arrow keys to navigate the main menu, use up and down arrow key to select the each item and press <Enter> to call out the list of creation steps. The main interface of BIOS configuration utility is as below:

Create Disk Array

Use the up and down arrow keys to select the **Create Array** command and press <Enter>.

```
                    VIA Tech. RAID BIOS Ver V1.10

 ▶ Auto Setup For Data Security          Create a RAID array with
 ▶ Array Mode RAID 1 (Mirroring)         the hard disks attached to
 ▶ Select Disk Drives                    VIA IDE controller
 ▶ Start Create Process
                                         F1   : View Array/disk Status
                                         ↑,↓  : Move to next item
                                         Enter: Confirm the selection
                                         ESC  : Exit

     Channel        Drive Name       Array Name   Mode   Size(GB)  Status

  Channel0 Master   Maxtor 34098H4                ATA 133 37.27   Hdd
  Channel1 Master   Maxtor 34098H4                ATA 133 37.27   Hdd
```

MSI Reminds You...
The "Channel", "Drive Name", "Mode" and "Size (GB)" in the following example might be different from your system.

Select **Array Mode** and press <Enter>, a list of array modes will appear. Highlight the target array mode that you want to create, and press <Enter> to confirm the selection. If RAID 1 or RAID 0/1 is selected, an option list will popup and enable the users to select **Create only** or **Create and duplicate**. **Create only** will allow BIOS to only create an array. The data on the mirroring drive may be different from the source drive. **Create and duplicate** lets BIOS copy the data from the source to the mirroring drive.

```
                    VIA Tech. RAID BIOS Ver V1.10

 ▶   RAID 0 for performance              Create a RAID array with
 ▶   RAID 1 for data protection          the hard disks attached to
 ▶   RAID 0/1                            VIA IDE controller
 ▶   RAID SPAN for capacity
                                         F1   : View Array/disk Status
                                         ↑,↓  : Move to next item
                                         Enter: Confirm the selection
                                         ESC  : Exit

     Channel        Drive Name       Array Name   Mode   Size(GB)  Status

  Channel0 Master   Maxtor 34098H4                ATA 133 37.27   Hdd
  Channel1 Master   Maxtor 34098H4                ATA 133 37.27   Hdd
```

After array mode is selected, there are two methods to create a disk array. One method is "**Auto Setup**" and the other one is "**Select Disk Drives**". **Auto Setup** allows BIOS to select the disk drives and create arrays automatically, but it does not duplicate the mirroring drives even if the user selected **Create and dupli-cate** for RAID 1. It is recommended all disk drives are new ones when wanting to create an array. **Select Disk Drives** lets the user select the array drives by their requirements. When using **Select Disk Drives**, the channel column will be activated. Highlight the target drives that you want to use and press <Enter> to select them. After all drives have been selected, press <Esc> to go back to the creation steps menu.

```
                    VIA Tech. RAID BIOS Ver V1.10

    ▶ Auto Setup For Performance         Create a RAID array with
    ▶ Array Mode RAID 0 (Striping)       the hard disks attached to
    ▶ Select Disk Drives                 VIA IDE controller
    ▶ Block Size 64K
    ▶ Start Create Process               F1   : View Array/disk Status
                                         ↑,↓  : Move to next item
                                         Enter: Confirm the selection
                                         ESC  : Exit

        Channel        Drive Name       Array Name   Mode    Size(GB)   Status

    [*]Channel0 Master   Maxtor 34098H4               ATA 133 37.27     Stripe0
    [*]Channel1 Master   Maxtor 34098H4               ATA 133 37.27     Stripe1
```

If user selects a RAID 0 array in step 2, the block size of the array can also be selected. Use the arrow key to highlight **Block Size** and press <Enter>, then select a block size from the popup menu. The block size can be 4KB to 64KB.

```
                    VIA Tech. RAID BIOS Ver V1.10

    ▶ Auto Setup For    4K              Create a RAID array with
    ▶ Array Mode RAID   8K              the hard disks attached to
    ▶ Select Disk Dri   16K             VIA IDE controller
    ▶ Block Size 64K    32K
    ▶ Start Create Pr   64K             F1   : View Array/disk Status
                                         ↑,↓  : Move to next item
                                         Enter: Confirm the selection
                                         ESC  : Exit

        Channel        Drive Name       Array Name   Mode    Size(GB)   Status

    [*]Channel0 Master   Maxtor 34098H4               ATA 133 37.27     Stripe0
    [*]Channel1 Master   Maxtor 34098H4               ATA 133 37.27     Stripe1
```

MSI Reminds You...
Even though 64KB is the recommended setting for most users, you should choose the block size value which is best suited to your specific RAID usage model.
4KB: *For specialized usage models requiring 4KB blocks*
8KB: *For specialized usage models requiring 8KB blocks*
16KB: *Best for sequential transfers*
32KB: *Good for sequential transfers*
64KB: *Optimal setting*

Use the arrow key to highlight **Start Create Process** and press <Enter>. A warning message will appear, Press **Y** to finish the creation, or press **N** to cancel the creation. Important note: All existing content in the hard drive will be destroyed after array creation.

Delete Disk Array

A RAID can be deleted after it has been created. To delete a RAID, use the following steps:

1. Select **Delete Array** in the main menu and press <Enter>. The channel column will be activated.
2. Select the member of an array that is to be deleted and press <Enter>. A warning message will show up, press Y to delete or press N to cancel.

Deleting a disk array will destroy all the data on the disk array except RAID 1 arrays. When a RAID is deleted, the data on these two hard disk drives will be reserved and become two normal disk drives.

Create and Delete Spare Hard Drive

If a RAID 1 array is created and there are drives that do not belong to other arrays, the one that has a capacity which is equal to or greater than the array capacity can be selected as a spare drive for the RAID 1 array. Select **Create/ Delete Spare** and press <Enter>, the channel column will then be activated. Select the drive that you want to use as a spare drive and press <Enter>, the selected drive will be marked as **Spare**. The spare drive cannot be accessed in an OS.

To delete a spare drive, highlight **Create/Delete Spare** and press <Enter>. The spare drive will be highlighted, press <Enter> to delete the spare drive.

Select Boot Array

User can select a disk array as boot device if user wants to boot operating system from an array. Boot disk array cannot be selected if the operating system does not boot from the disk array. Highlight the **Select Boot Array** item; press <Enter> and the channel column will be activated. Then highlight the target disk array and press <Enter>. If user selects a disk array that has a boot mark and press <Enter>, its boot setting will be canceled.

View Serial Number of Hard Drive

Highlight **Serial Number View** and press <Enter>. Use arrow key to select a drive, the selected drive's serial number can be viewed in the last column. The serial number is assigned by the disk drive manufacturer.

Press the **F1** key to show the array status on the lower screen. If there are no disk arrays then nothing will be displayed on the screen.

Duplicate Critical RAID 1 Array

When booting up the system, BIOS will detect if the RAID 1 array has any inconsistencies between user data and backup data. If BIOS detects any inconsistencies, the status of the disk array will be marked as critical, and BIOS will prompt the user to duplicate the RAID 1 in order to ensure the backup data consistency with the user data.

```
 ══ Critical RAID 1 ══════════════        ══ Critical Status ══
 Duplicate now                            The RAID 1  array needs to
 Continue to boot                         be duplicated to ensure
                                          data consistancy.

                                          Fault Hdd Found:
                                          Channel 1 Device 0 Fault

 ═ Remaining members of the failed array ══════════════════════
     Channel        Drive Name      Array Name  Mode  Size(GB)  Status
 Channel1 Device0  IC35L040AVVA07-0   Array0   ATA 100 38.34   Mirror
 Channel0 Device0  IC35L040AVVA07-0   Array0   ATA 100 38.34   Source


 Note:
 1)Press <ESC> to Exit.
 2)After Execute.Press <TAB> immediately can into Utility Window!
```

If user selects **Continue to boot,** it will enable duplicating the array after booting into OS.

Rebuild Broken RAID 1/0+1 Array

When booting up the system, BIOS will detect if any member disk drives of RAID has failed or is absent. If BIOS detects any disk drive failures or missing disk drives, the status of the array will be marked as broken.

If BIOS detects a broken RAID 1 array but there is a spare hard drive available for rebuilding the broken array, the spare hard drive will automatically become the mirroring drive. BIOS will show a main interface just like a duplicated RAID 1 main interface. **Continue to boot** will enable duplicating the array after booting into operating system.

If BIOS detects a broken RAID 1 or 0+1 array but there is no spare hard drive available for rebuilding the array, BIOS will provide several operations to solve such problem.

1. **Power off and Check the Failed Drive:**
   This item turns off the computer and replaces the failed hard drive with a good one. If your computer does not support APM, you must turn off your computer manually. After replacing the hard drive, boot into BIOS and select **Choose replacement drive and rebuild** to rebuild the broken array.

2. **Destroy the Mirroring Relationship:**
   This item cancels the data mirroring relationship of the broken array. For broken RAID 1 arrays, the data on the surviving disk will remain after the destroy operation. However, **Destroy the Mirroring Relationship** is not recommend because the data on the remaining disk will be lost when the hard drive is used to create another RAID 1 array.

3. **Choose Replacement Drive and Rebuild:**
    This item enables users to select an already-connected hard drive to rebuild the broken array. After choosing a hard drive, the channel column will be activated.

    Highlight the target hard drive and press <Enter>, a warning message will appear. Press **Y** to use that hard drive to rebuild, or press **N** to cancel. Please note selecting option **Y** will destroy all the data on the selected hard drive.

4. **Continue to boot:**
    This item enables BIOS to skip the problem and continue booting into OS.

Installing Software

Install Driver in Windows XP/2000

➤ **New Windows XP/2000 Installation**

The following details the installation of the drivers while installing Windows XP.
1. Start the installation:
   Boot from the CD-ROM. Press **F6** when the message "Press F6 if you need to install third party SCSI or RAID driver" appears.
2. When the Windows Setup window is generated, press **S** to specify an Additional Device(s).
3. Insert the driver diskette *Intel ICH6R/VIA VT6410 Disk Driver* into drive A: and press <Enter>.
4. Depending on your operation system, choose the driver *VIA RAID Controller (Windows XP), VIA RAID Controller (Windows 2000)* which matches to your OS.
5. Press <Enter> to continue with installation or if you need to specify any additional devices to be installed, do so at this time. Once all devices are specified, press <Enter> to continue with installation.
6. From the Windows XP/2000 Setup screen, press the <Enter> key. Setup will now load all device files and then continue the Windows XP installation

➤ **Existing Windows XP/2000 Driver Installation**

1. Insert the MSI CD into the CD-ROM drive.
2. The CD will auto-run and the setup screen will appear.
3. Under the **Driver** tab, click on *VIA IDE RAID Drivers*.
4. The drivers will be automatically installed.

➤ **Confirming Windows XP/2000 Driver Installation**

1. From Windows XP/2000, open the **Control Panel** from **My Computer** followed by the System icon.
2. Choose the **Hardware** tab, then click the **Device Manager** tab.
3. Click the "**+**" in front of the **SCSI and RAID Controllers** hardware type. The driver *VIA VT6410 RAID Controller* should appear.

Installation of VIA IDE RAID Utility

The VIA IDE RAID Utility is the software package that enables high-performance in the Windows XP/2000 operating system. This version of VIA IDE RAID Utility contains the following key features:

> ➤ IDE RAID driver
> ➤ VIA IDE RAID utility
> ➤   RAID0, RAID1 & RAID0+1 functions

Insert the MSI CD and click on the **VIA IDE RAID Utility** to install the software.
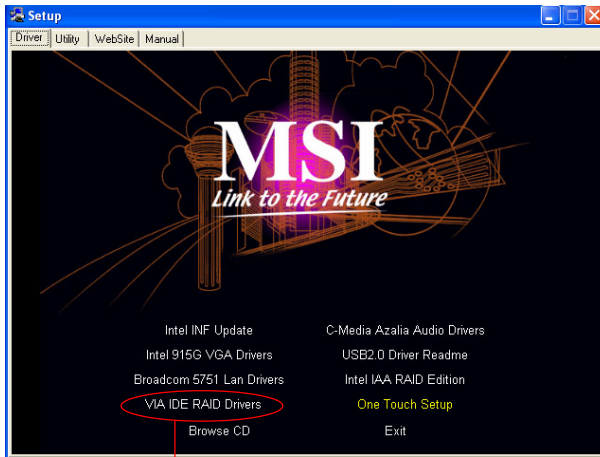
Click on this item

The **InstallShield Wizard** will begin automatically for installation. Click on the **Next** button to proceed the installation in the welcoming window.
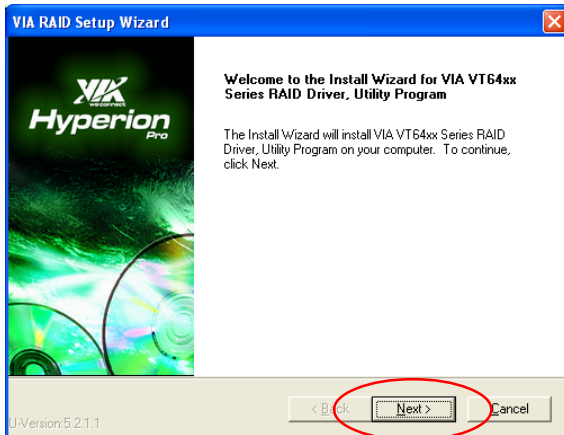
Select **I Agree** to accept the VIA Software License Agreement, and click on the **Next** button to continue.
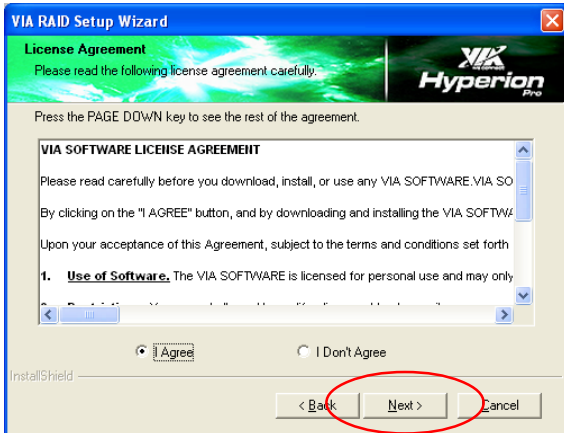
Put a check mark in the check box to install the feature you want. Then click **Next** button to proceed the installation.
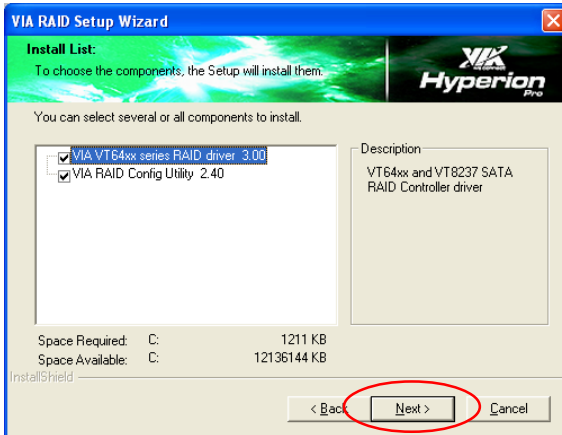
Remember to restart your computer before using this newly installed program.

Using VIA RAID Tool

Once the installation is complete, go to **Start** ---> **Programs** --->**VIA** ---> **RAID** to enable **VIA RAID TOOL**.
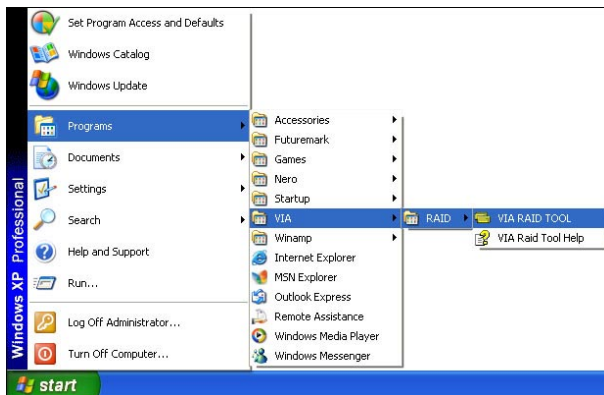
After the software has finished installation, it will automatically start every time Windows is initiated. You may double-click on the icon shown in the system tray of the tool bar to launch the **VIA RAID Tool** utility.

The main interface is divided into two windows and the toolbar above contain the main functions. Click on these toolbar buttons to execute their specific functions. The left window pane displays the controller and disk drives. The right window pane displays the details of the controller or disk drives. In this model, the available features are as following:

View by Controllers

Check All Disks

View Event log

Help Topics

Click on or button to determine the viewing type of left window pane. There are two viewing types: By controllers and by device. Click on the object in the left window pane to display the status of the object in the right window pane. The following screen shows the status of Array 0---RAID 0.
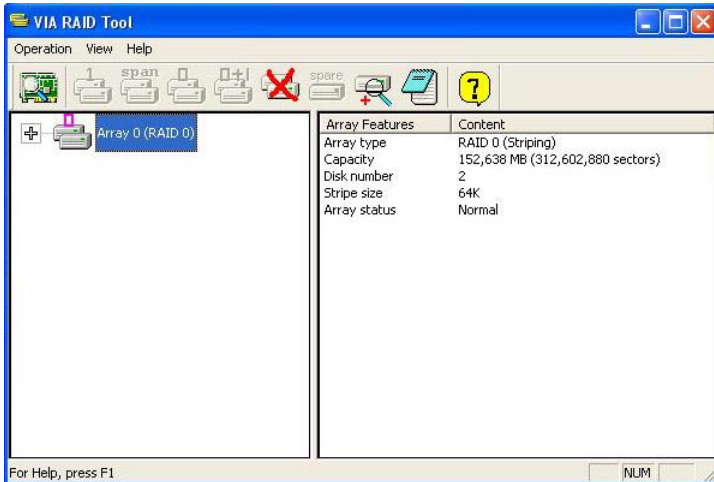
Click on the plus (+) symbol next to Array 0---RAID 0 to see the details of each disk.
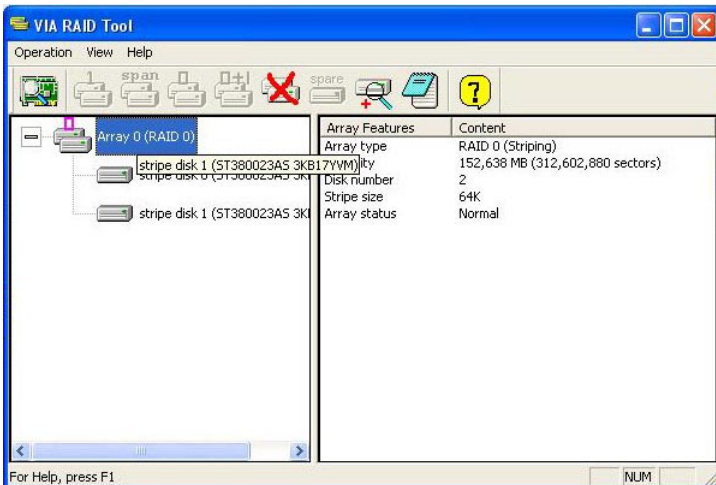
You may also use the same or button to view the statuses of Array 0---RAID 1.
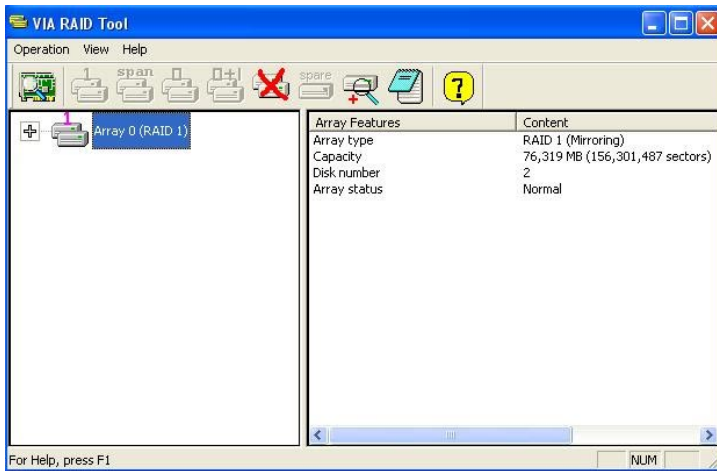
Click on the plus (+) symbol next to Array 0---RAID 1 to see the details of each disk.
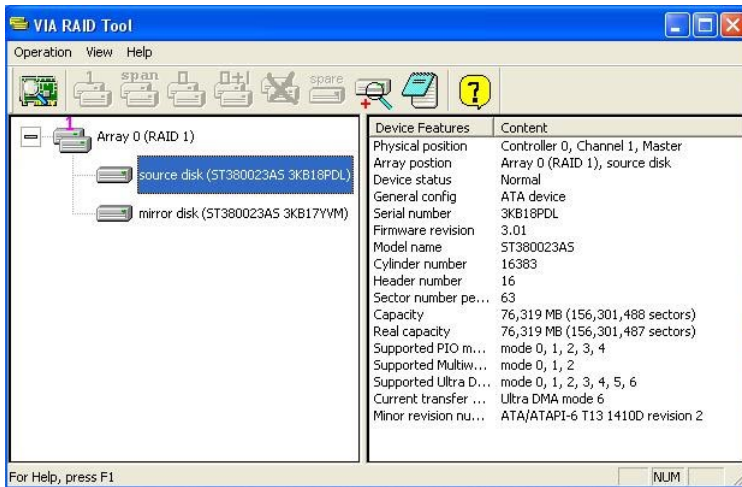
Introduction to

CMI 9880L Audio Codec

The motherboard comes with CMI9880L audio chip, which supports the brand new Azalia specification. In addition, C-Media designs a multi-stream function which allows the rear audio & front panel to play different audio sources simultaneously. CMI 9880L also allows the board to attach 4, 6, and 8 speakers for better surround sound effect. The section will guide you to experience the powerful features of this audio chip.

Installing the Audio Codec Driver

To install C-Media drivers:

1. Insert the MSI CD into the CD-ROM drive. The setup screen will automatically appear.
2. Click on **C-Media Azalia Audio Driver**.
3. Follow the on-screen instructions to complete installation.
4. Restart the system.
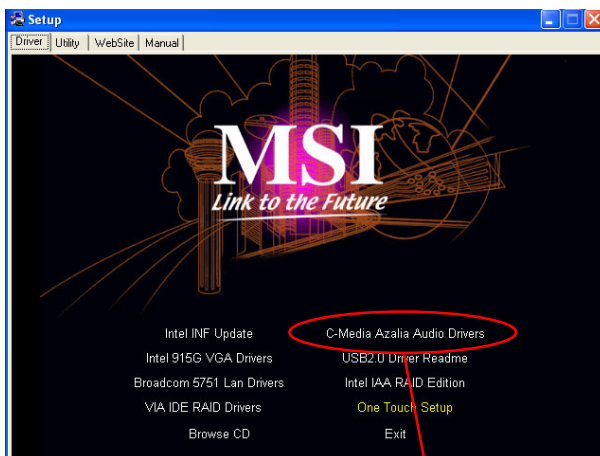
Click the **C-Media Azalia Audio Driver**

Software Configuration

To have your 4-/6-/8-channel audio work, you must set appropriate configuration in the C-Media software application. Click the C-Media Mixer icon [Xear 3D] from the window tray on the bottom, and choose **Open**.

Then the **C-Media 3D Audio Configuration** dialogue will appear. Click on the **Main Setting** tab to start the configuration of the audio.

Main Setting

1. Output Device: Analog Output

Here you can configure the preferred output device among earphone, 2-channel speakers, 4-channel speakers, 6-channel speakers & 8-channel speakers. Click on the desired output device and the figure of the virtual speaker will change for the correct demonstration simultaneously.
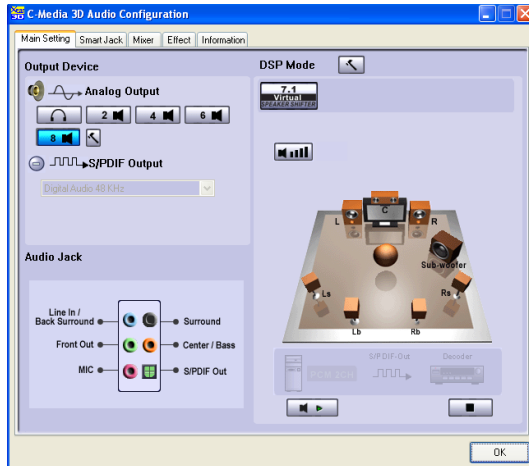
Click on the icon and the **Speaker Environment** dialogue appears.

➤ **Bass Enhancement:** You may enable the **Bass Enhancement** option to enhance the bass signal effect

➤ **Center/Bass Output Swap:** Enabling this option will exchange the center/bass output channel. PC speaker manufactures typically define that the center signal is delivered by tip of the stereo plug and the bass signal is by ring of it, as the figure showed below. However, some speakers have opposite definition. Please use this option to solve the possible trouble.
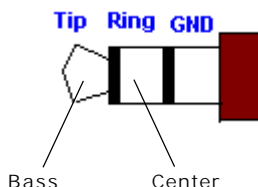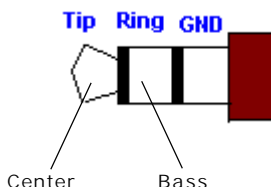
In the left side, check the radio button next to the speaker to fit your audio devices. In the **Audio Jacks** tab in the right side, the audio will function as it shows. Please confirm you have connected your hardware to correct jacks before using.

2. Output Device: S/PDIF Output

Click on the blue radio button to enable the S/PDIF output function. It will play Digital Audio to Digital S/PDIF Output. Choosing this option allows the output digital playing audio from your computer like DVD, VCD, digital CD, MP3, Wave... etc through S/PDIF in 48KHz sample rate.

 S/PDIF Out-Optical   S/PDIF Out-Coaxial

3. Audio Jack

This part shows the audio jack on your mainboard and indicates each function.

4. DPS Mode: Disabled

This part provides an advanced, amazing and considerate feature-dynami-cally adjustable multi-channel sound system no matter what listening appliance you are using and what application you are running.

The default setting for **DPS Mode** is off, in which the hammer icon ⬜ next to the DPS Mode and the **7.1 Virtual SPEAKER SHIFTER** ⬜ button remain gray.

Here you can test each connected speaker to ensure if each channel audio operation works properly. If any speaker fails to make sound, then check whether the cable is inserted firmly to the connector or replace the bad speakers with good ones.
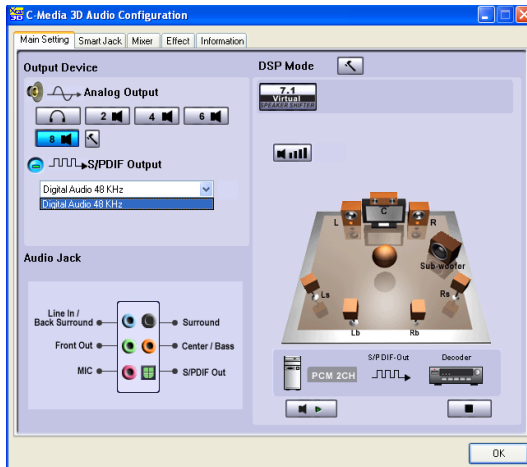

Select the speaker by clicking it to test its functionality. The one you select will light up and make testing sound.

5. DPS Mode: Enabled

This part provides an advanced, amazing and considerate feature-dynamically adjustable multi-channel sound system no matter what listening appliance you are using and what application you are running.

Click the hammer icon next to the DPS Mode and click the **7.1 Virtual SPEAKER SHIFTER** button, or click the **7.1 Virtual SPEAKER SHIFTER** button directly to enable this function, then all the speakers are available to adjust.

You may move all the virtual speakers to anywhere. Center is usually for Voice in DVD and just suitable to move in vertical to keep the sound in the center. Subwoofer signal is directionless low-frequency sound to human ears. Thus, please move it horizontally to express strength or weakness.
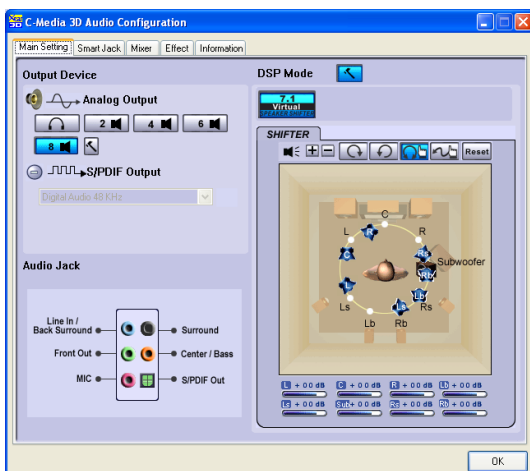
Toolbar of DPS Mode

<1>   <2>   <3>   <4>   <5>

<1>   Rotate all the virtual speakers clockwise.
<2>   Rotate all the virtual speakers anti-clockwise.
<3>   Move all the virtual speakers randomly.
<4>   Move individual virtual speaker randomly.
<5>   Reset the change to the default setting.

Smart Jack

Here it indicates the audio output of each back panel jack.

1. Back Panel

The audio configuration shown here should be identical to the audio jacks on your mainboard. Follow the indication on it to connect the audio output devices correctly.

2. Front Panel

For the front panel audio jack, usually the green one is connected to Line-Out device while the pink one is for MIC. However, you can configure the definition as you wish by clicking the hammer icon, and select the preferred function in the **Smart Jack Retasking Function** dialogue.
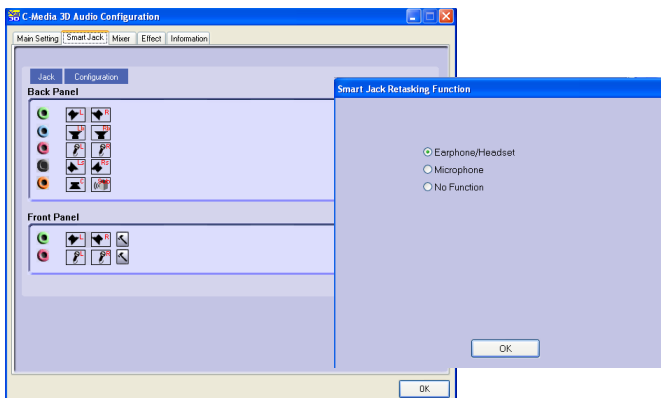
Mixer

1. Multi-Stream Function

CMI9880L supports an outstanding feature called Multi-Stream, which means you may play different audio sources simultaneously and let them output respectively from the indicated real panel or front panel. This feature is very helpful when 2 people are using the same computer together for different purposes.

Go to **Control Panel --> Sounds, Speech and Audio Devices --> Sounds and Audio Devices --> Sounds and Audio Devices Properties**, and choose **Audio** tab. In **Sound playback / Default device:** part, you can see two options: **C-Media Azalia Rear Panel** & **C-Media Azalia Front Panel.**
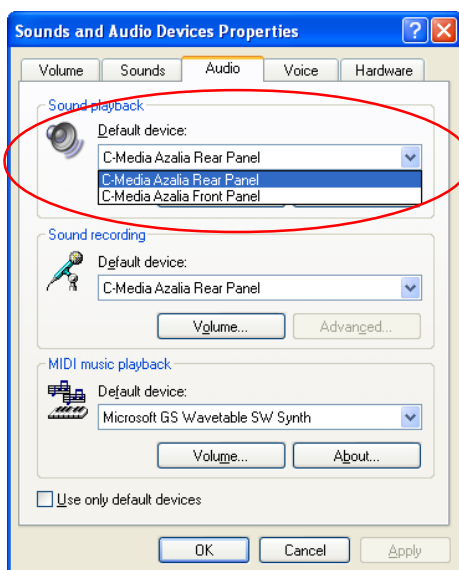
When you are playing the first audio source (for example: use Windows Media Player to play DVD/VCD), the output will be played from the rear panel, which is the default setting.

Then switch the setting to **C-Media Azalia Front Panel** and click **Apply**, then use a different program to play the second audio source (for example: use Winamp to play MP3 files). You will find that the second audio source (MP3 music) will come out from the Line-Out audio jack of Front Panel.

In the **Mixer** part, you may adjust the volumes of the rear and front panels individually.
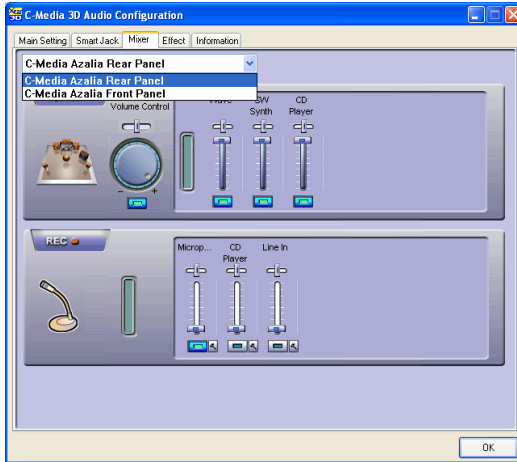
2. Recording

If you want to use microphone to record, usually the microphone is connected to the MIC jack (the pink one) in the rear audio panel. You can start recording in this case. However, if you want to hear the voice you are recording, click on the small hammer below the Microphone, and enable the checkbox of **Monitoring (Monitoring Microphone to Line Out)**.

The **Monitoring (Monitoring Microphone to Line Out)** function is also available for the **CD Player** & **Line In** recording. Click on the small hammer next to each of them to configure.
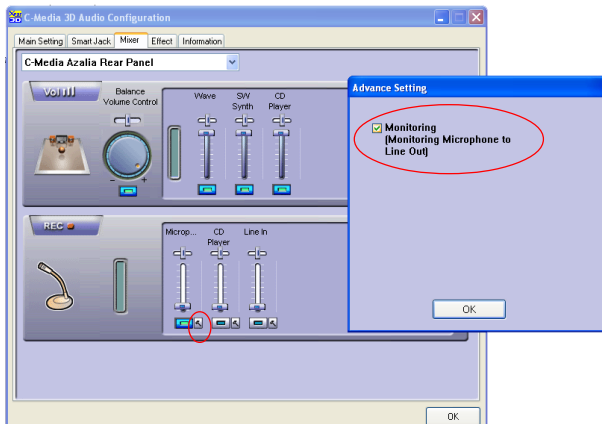
If you'd like to connect your microphone to the front audio panel, please go to the **Sounds and Audio Devices Properties** dialogue and go to the **Sound recording** part. The default setting of this item is **C-Media Azalia Rear Panel** and you have to switch it to the **C-Media Azalia Front Panel.** Please note the **Monitoring (Monitoring Microphone to Line Out)** is only available for the rear audio panel.
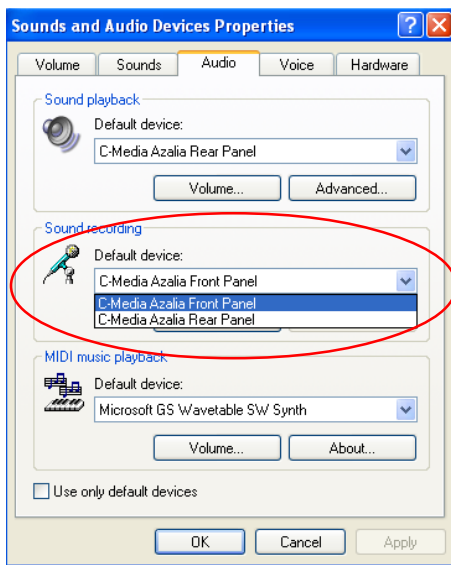
Effect

From this part, you may choose the sound effect you like, such as environment effects, environment sizes and equalizers. You may also define your own equalizers and save them for the future usage.
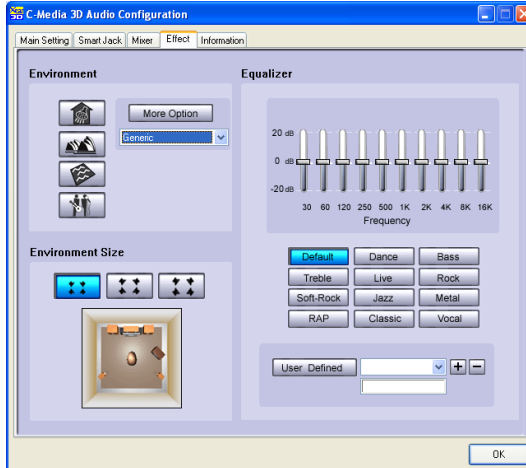
Information

In this tab it provides some information about the Azalia Audio Configuration utility, including 3D Audio Engine, Audio Codec, Audio Driver Version, Audio Controller & DirectX Version. You may also select the language of this utility by choosing from the **Language** list.